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SAILING DIRECTIONS  
FOR THE  
COAST OF IRELAND  
PART. 1.  

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1877



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OFFICIAL COPY.

SAILING DIRECTIONS  
FOR  
THE COAST OF IRELAND,  
PART I.

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SOUTH, EAST, AND NORTH, COASTS  
OF IRELAND.

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COMPILED FROM VARIOUS ADMIRALTY SURVEYS

BY

STAFF COMMANDER RICHARD HOSKYN, R.N.

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SECOND EDITION.



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PUBLISHED BY ORDER OF THE LORDS COMMISSIONERS OF THE ADMIRALTY.

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LONDON:  
PRINTED FOR THE HYDROGRAPHIC OFFICE, ADMIRALTY  
AND SOLD BY  
J. D. POTTER, AGENT FOR THE SALE OF ADMIRALTY CHARTS,  
81 POULTRY, AND 11 KING STREET, TOWER HILL.  
1877.

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*Price Three Shillings.*

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## ADVERTISEMENT

TO THE SECOND EDITION.

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This work, containing Sailing Directions for the South, East, and North coasts of Ireland, was compiled from various Admiralty Surveys by the late Captain Richard Hoskyn, R.N., in 1866.

The coast from Mizen head to Poor head was surveyed by Commander Wolfe and Lieutenant Church, 1843-49; from Poor head to the river Boyne by Captain G. A. Frazer, 1837-52; from the river Boyne to Inishowen head by R. Hoskyn, master, 1853-63; and from Inishowen head to Malin head by Captain G. A. Bedford, 1857. The banks of soundings to the west, south-west, and north of Ireland were surveyed by Captain M. White, 1812-20; Commander A. G. Edye, 1859-61; and R. Hoskyn, master, 1862; and the Irish channel by Captain F. W. Beechey, 1843-46.

The coast from Wexford to Dublin bay, including the off-lying banks, was re-surveyed in 1873-75, by Staff Commander J. H. Kerr, R.N.

The present edition has been revised and corrected from the latest information by Mr. E. C. Davison, R.N.

F. J. E.

Hydrographic Office, Admiralty, London,  
September, 1877.

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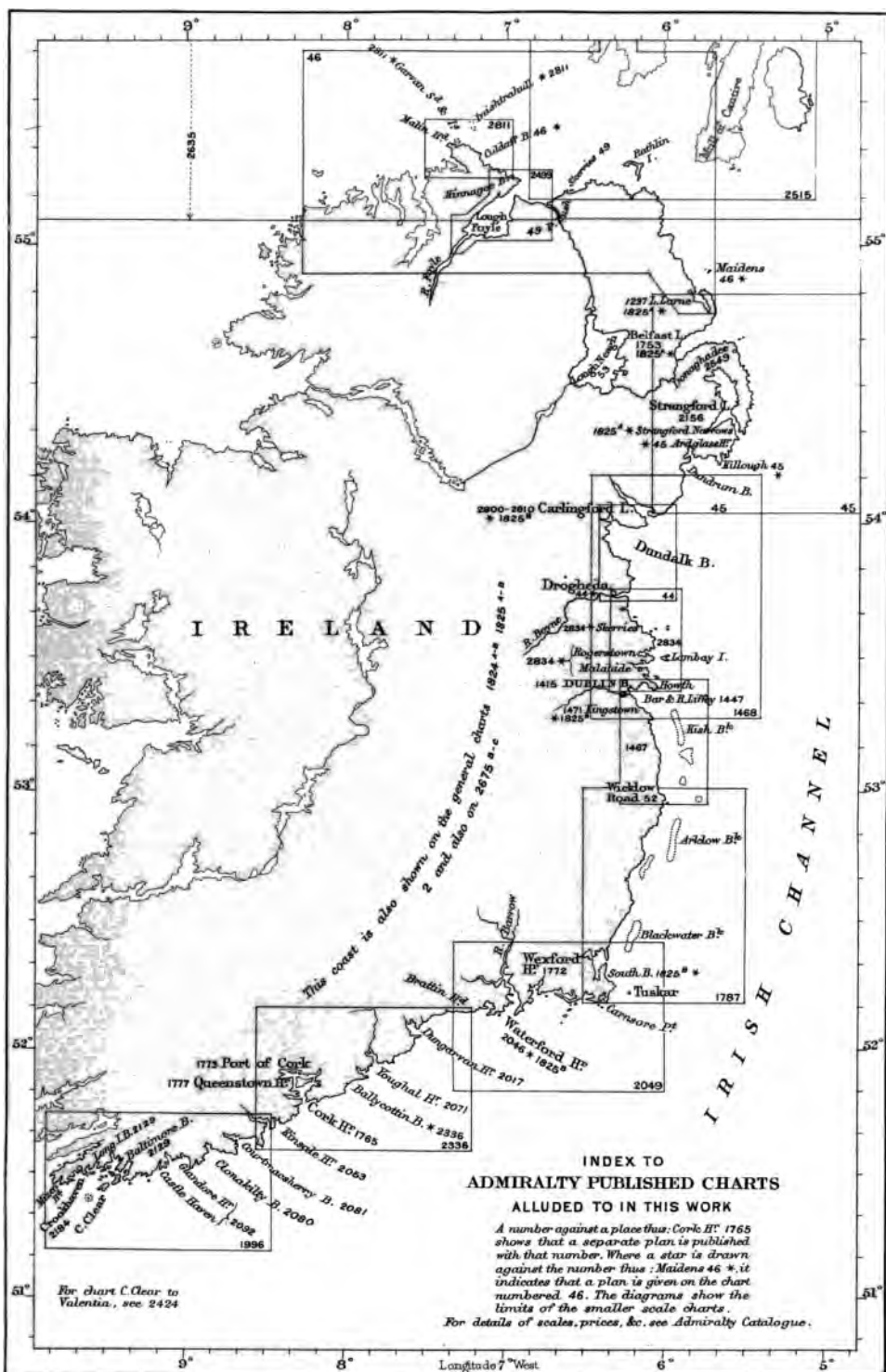
**IN THIS WORK THE BEARINGS ARE ALL MAGNETIC,  
EXCEPT WHERE MARKED AS TRUE.**

**THE DISTANCES ARE EXPRESSED IN SEA MILES OF  
60. TO A DEGREE OF LATITUDE.**

**A CABLE'S LENGTH IS ASSUMED TO BE EQUAL TO  
100 FATHOMS, OR THE TENTH PART OF A MILE.**

**THE SOUNDINGS ARE REDUCED TO LOW WATER  
OF ORDINARY SPRING TIDES.**





# SAILING DIRECTIONS

FOR THE

## COAST OF IRELAND.

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### PART I.

---

### SOUTH, EAST, AND NORTH, COASTS.

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#### CHAPTER I.

#### DIRECTIONS FOR APPROACHING THE LAND.—SOUTH COAST OF IRELAND FROM MIZEN HEAD TO OLD HEAD OF KINSALE.

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VARIAION in 1877.

Fastnet rock  $24^{\circ} 0' W.$ , Old Head of Kinsale  $23^{\circ} 20' W.$ , decreasing 9 minutes annually.

---

SHIPS approaching the coast of Ireland from the westward, must during thick weather, or when their true position has not recently been well ascertained, make an early use of the deep-sea lead, and endeavour to obtain soundings on the outer edge of the bank. For as the 100-fathoms line is met with only 22 miles to the westward of the Skelligs, they may, if on this parallel, run in two hours from depths that are practically beyond their reach, to a position of great danger.

At 150 miles to the westward of Ireland, there is an outer bank of soundings, but its depths in the track of ships steering for cape Clear are too great to be of service to the ordinary navigator. Its shoalest part is near its north end, on the parallel of, and 130 miles to the westward of Slyne head, where there is a tract of gravel and coarse sand, with from 82 to 95 fathoms water, named Porcupine bank. From this it runs in a

S.W. by S. direction 100 miles, with depths of about 200 fathoms, sand and oaze; 45 miles farther in the same direction, on the parallel of  $51^{\circ}$ , the depth increases to 395 fathoms, all fine sand and oaze; to the southward of this parallel the bank has not been examined. The meridian of  $15^{\circ}$  W. is its western limit, from whence it quickly dips to the ocean depths of 1,700 and 1,900 fathoms, with an incline varying from 6 to 19 feet in 100 feet horizontal. To the eastward or between it and the shore bank, there is a great depression, increasing in depth as we proceed to the southward, from 185 fathoms abreast Porcupine bank to 1,180 fathoms on the parallel of  $51^{\circ}$ .

**SOUNDINGS.**—On the parallel of the Fastnet, or that of  $51^{\circ} 23' \text{ N.}$  and in long.  $11^{\circ} 30' \text{ W.}$ , there is 286 fathoms, fine brown sand and mud, on the outer edge of the shore bank; in the next 10 or 12 miles to the eastward the depths decrease rapidly. In longitude  $11^{\circ} 2' \text{ W.}$  there is 100 fathoms, and in longitude  $10^{\circ} 20'$ , or 21 miles to the westward of Mizen head, 73 fathoms, all on the same description of bottom. From hence to the shore the soundings are irregular, and the bottom varied with patches of rock and coarse ground. In hazy weather approach no nearer to the Fastnet than 60 fathoms.\*

If uncertain of the latitude, it must be borne in mind that the depth of 60 fathoms will be found at  $1\frac{1}{2}$  miles distance from the Skelligs, and the same depth within 2 miles of Bull, Cow, and Calf, rocks.

When sailing eastward on the parallel of  $51^{\circ} 10' \text{ N.}$  or to the southward of it, if the soundings have decreased to 60 fathoms, it may be concluded that the ship is to the eastward of the meridian of Mizen head, viz.,  $9^{\circ} 49' \text{ W.}$ , and she may then steer  $\text{E. } \frac{1}{4} \text{ S.}$  along the Irish coast. This course will carry her 10 miles to the southward of the Fastnet, and about 8 miles without all the headlands as far eastward as Saltee lightship. The shore between cape Clear and Waterford is, generally speaking, steep-to, and more so in the neighbourhood of the cape than to the eastward, where the transition from deep to shoal water is tolerably progressive.

Ships from the westward usually make the land in the vicinity of cape Clear. This course cannot, however, be recommended when strong southerly winds prevail, unless good observations have been obtained a very short time previously, for with these winds vessels have often found themselves to the northward of their reckoning, and, making the land to leeward of the Skelligs, have been detained several days in endeavouring to work round the cape.

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\* See Admiralty chart of banks and soundings westward of the British isles, No. 2, scale,  $m = 0.03$  inch; also chart of west coast of Ireland, No. 1,824*b*, scale,  $m = 0.15$  inch. For soundings in the approach to the English channel, see Channel Pilot, Part I., 1874, p. 4.

In thick weather it may be well to run on the parallel of  $51^{\circ}$  N., until the vessel gets into 65 fathoms or less water;\* then steer E. by N. or E.N.E., keeping the lead going, and be careful not to advance into less than 50 fathoms, until on the meridian of Old Head of Kinsale, when the land may be approached to 40 fathoms water. An E.  $\frac{1}{4}$  S. course may now be steered, having constant recourse to the deep sea lead. By proceeding in this manner it is probable that, if not seen before, the land will be made in the vicinity of Waterford, or about Saltee islands, but no vessel should attempt to run up the Irish channel without having first seen the land.

After having once made the land, ships should endeavour to keep it in view. Generally speaking, they keep at too great a distance from it, by which they frequently miss a sight of lights and land marks, which it is important that they should see, and which, in the event of having to seek a port of refuge, would be found of very great service. The rule in coasting is to see every guide in passing it, unless thick weather should prevent it, and in that case to give strict attention to the lead and to the set of the tides until the next object is sighted.

**TIDAL STREAMS.**—The great tide wave from the Atlantic ocean appears to split a little to the southward of the Skelligs; one part, going to the northward, sweeps round the north-west coasts, and enters the Irish sea by the North channel; the other part, going to the southward, round cape Clear, enters the Irish sea by the South channel, the two streams flowing on together towards Liverpool bay, where they unite, causing a rise of tide of 28 feet on springs, and making high water 7 hours after it occurs at the point of their separation.

Along the west and south coasts the stream is feeble in the offing, but as the channels are approached it acquires a higher velocity, particularly in the North channel, where it runs at the rate of 6 knots on springs.

At the distance of 70 miles to the westward of cape Clear, Captain M. White found the tide stream running for 4 hours between S.W. and W. by S. and for 8 hours between W. by N. and N.N.E., and not at all to the eastward or south-east; to which circumstance he attributed the northerly and westerly set experienced by some ships in this locality. Twenty-four miles to the southward of cape Clear the first of the ebb sets S.W., veering round to West and N.W. The first of the flood sets N. by E., veering round by East to S.S.E., at from  $\frac{3}{4}$  to  $1\frac{1}{2}$  knots per hour.

Six miles south-west of Seven heads the stream runs to the eastward until half-ebb by the shore, when it is slack for an hour, and then com-

---

\* In 1875, Captain Labadie, of the French barque *Ville de Dieppe*, discovered soundings of 38 to 40 fathoms in lat.  $50^{\circ} 35' N.$ , long.  $8^{\circ} 0' W.$ , where 60 and 65 fathoms had formerly been supposed to exist.

mences its western course, which it continues until half-flood by the shore, when another hour's slack intervenes before commencing its eastern course. Its rate seldom exceeds  $1\frac{1}{2}$  knots per hour. Near the coast the stream takes the direction of the shore, and is slack from half an hour to an hour at each change of tide. In the offing, however, there exists no inactivity, the stream preserving its constant revolving motion, generally with the sun.

In making allowance for the different sets and velocity of the tide, as affecting the place of a ship, much consideration is due to the force and direction of the wind. The foregoing remarks will serve to indicate the general course of the tides; a particular description for each separate locality will be found in the body of the work.

**WINDS.**—The prevailing winds on the coast of Ireland are those from the westward, which are often accompanied by rain and thick weather. Moderate winds from north and north-east are those which bring fine weather. Dead calms are of rare occurrence. When they occur in winter, they are generally the precursors of bad weather, and always indicate a change in the direction of the wind. When south-west gales are accompanied with heavy rain, the wind often flies suddenly up to north-west, the weather clears, and it blows harder than before. If the wind backs round to eastward of south, prolonged bad weather is sure to follow.

The result of three years' observations of the direction of the wind on the north, west, and south coasts, referred to the principal points of the compass, gives as the mean duration for each year,—from the North 35 days, N.E. 24 days, East 27 days, S.E. 31 days, South 46 days, S.W. 73 days, West 64 days, N.W. 58 days, Calm 7 days.\*

**Fogs** are more prevalent in the Irish channel, and in its close bays and estuaries, than on the western coast, where from 15 to 20 days of fog would probably be the extreme number in a year. The mean† number recorded on the west coast, for the three years ending 1858, gives only 15 days of fog for each year, and at Liverpool 28 days in a year.‡ Hazy weather however prevails, often obscuring the land from view.

**The COAST§** in the vicinity of cape Clear is high, precipitous, and bold, increasing in height to the northward of the cape, where it is fringed by outlying islets and rocks of considerable elevation, which in

\* J. H. Babington, Esq., Meteorological Department, Board of Trade.

† Commander A. G. Edye, R.N., Admiralty Surveyor.

‡ J. Hartnup, Esq., Liverpool Observatory.

§ See Admiralty charts, Ireland, west coast, No. 1,824*b*; scale,  $m = 0.15$  inch. Also, sheet XI., Valentia to cape Clear, No. 2,424; scale,  $m = 0.5$  inch. Also, sheet XII., Mizen head to Kinsale, No. 1996; scale,  $m = 0.5$  inch.

clear weather are easily recognised at a great distance. This part of the coast is the ordinary landfall of ships from the Atlantic ocean. The most conspicuous objects which first present themselves to a vessel coming from westward on the parallel of the Fastnet, or  $51^{\circ} 23' N.$ , are Hungry hill, Dursey island, and Skellig rocks, proceeding to the eastward Mizen peak will appear in view, and finally cape Clear, and Fastnet rock. But this part of the coast is frequently obscured by haze, and during the winter season is subject to powerful gales and a turbulent sea. It however abounds with good harbours and roadsteads, and is comparatively free from hidden danger. To the eastward of the cape the shore preserves its bold aspect, but is less indented. Its principal dangers are Daunt rock, off the entrance of Cork harbour, and Coningbeg rock to the southward of Saltee islands. Stag rocks off Toe head are free from hidden danger; while Fastnet rock (formerly the dread of seamen in a dark night), has been converted into a beacon of safety by the erection of a lighthouse upon it.

**FASTNET ROCK**, W.  $\frac{3}{4}$  S. nearly 4 miles from cape Clear, is a compact schist rock, of 93 feet elevation, and presents an area at low water of 360 by 180 feet. The bottom westward, southward, and north-eastward of the Fastnet is both shoal and rocky; in the latter direction, at the distance of one quarter of a mile from the Fastnet, there is a flat rock, with only 11 feet water over it, which often breaks. The space between the Fastnet and the shore is free from danger, though in boisterous weather the sea breaks here and there violently, caused by the rough nature of the ground. When navigating in the vicinity of the Fastnet, do not approach it nearer than one mile. Mizen peak in line with Brow signal tower leads midway nearly between the Fastnet and cape Clear. The Peak, kept open to the westward of Brow head, leads about half a mile south-westward of the Fastnet. These marks are given in the event of partial fog to which this part of the coast is very much subject.\*

**LIGHT.**—A lighthouse was erected on the Fastnet in 1854 to supersede that formerly on cape Clear. It is a circular tower, 92 feet high from the base to the vane, painted white, with a broad *red* belt in the middle, and exhibits at an elevation of 148 feet above high water, a *revolving white* light, which attains its greatest brilliancy *every minute*, and is visible in clear weather at the distance of 18 miles.

**MIZEN HEAD** may be known by its remarkable peak, 755 feet high. Near the head the tide streams run at the rate of 4 miles per hour, causing a dangerous race. At a distance from the shore the stream loses its velocity, and at 5 miles from the head it runs only  $1\frac{1}{2}$  knots.

---

\* Lieut. Church, R.N., Admiralty Surveyor.



**Barley Cove**, one mile to the eastward of Mizen head, may be known by the tracts of sand at its head. Viewed from the offing it appears like a good harbour, for which it has on several occasions been mistaken by foreigners, there is, however, no safety in it with any wind. About the middle of the cove is a large rock awash at high water, called **Barley rock**. **Brow head**, the eastern point of the cove, is 309 feet high, and bluff, with a ruined telegraph tower on it. The head slopes down to the eastward to **Galley cove**, a small bight, only separated from **Crookhaven** harbour by a narrow sandy isthmus.

**CROOKHAVEN**, 5 miles eastward of Mizen head, and N.  $\frac{3}{4}$  W. 6 miles from the Fastnet, is greatly resorted to by homeward-bound vessels during easterly winds, and is a very convenient place for vessels under 14 feet draught.\*

**Streek head**, forming the southern point of entrance to the harbour, is a remarkable feature, rising abruptly from the sea to the height of 148 feet. On its south side there are some high detached rocks, which must not be approached within a cable. **Alderman rocks**, extending four cables to the eastward of **Streek head**, and from 18 to 28 feet above high water, are foul to nearly a cable's distance to the northward. The north point of entrance, on which stands the lighthouse, is bold-to and clear of danger. **Crookhaven** is further distinguished by three lofty castellated towers, used as look-outs by the pilots, who board vessels in any weather on the usual signal being made.

The harbour is about 2 miles long. Abreast the lighthouse it is 2 cables wide, with from 5 to  $5\frac{1}{2}$  fathoms at low water, and abreast the coast-guard station, which is a long range of white houses half-a-mile farther up, it is only one cable wide, with from 3 to  $3\frac{1}{2}$  fathoms. Above this the water shoals suddenly to about 2 fathoms, and then gradually decreases in depth to the head of the harbour. It is said to be filling up from the sand brought into it from **Barley** and **Galley** coves by the prevailing westerly winds.

The bottom is soft mud, and the only danger is a rock off **Granny island**, above the usual anchorage, which shows at low water spring tides. Vessels therefore of any burthen, in the event of loss of anchors, or otherwise in distress, may boldly run up the haven, until they take the ground, provided they keep in the middle of the channel.

The best anchorage for a large vessel is abreast the second tower from the lighthouse, in  $3\frac{1}{2}$  fathoms, with the small bower about half a cable from the north shore, and the best bower near **Boat-house cove** on the opposite shore. Vessels drawing upwards of 12 feet cannot bring **Coghlan**

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\* See Admiralty plan, S.W. coast of Ireland, with an enlarged plan of **Crookhaven**, No. 2,184, scales,  $m = 3\cdot0$  and  $7\cdot0$  inches.

tower more southerly than S.S.W. without touching at low water. In fine weather, however, no inconvenience can arise from sueing.

The village of Crookhaven, consisting of some poor cottages, is on the south side of the harbour; the post-office and coast-guard station are on the northern shore, half-a-mile within the entrance. Supplies of all kinds are very scarce.

In moderate weather the American steamers communicate their intelligence here, which is at once transmitted by means of the electric telegraph.

**LIGHT.**—The lighthouse, a white tower on Rock island, the north point of the entrance, shows, at an elevation of 67 feet, a *fixed* light. Coming from the westward, this light will not be seen until it opens eastward of Streek head, bearing N.  $\frac{1}{4}$  E., between which bearing and N.W. by W. it appears *red*; northward of the latter line of bearing it shows *white*. In clear weather, the white light may be seen at the distance of 13 miles, the red light at 10 miles. As a guide to the harbour the light would be more usefully placed on Alderman rocks.

**TIDES.**—It is high water, full and change, at Crookhaven, at 4h. 9m.; springs rise  $9\frac{3}{4}$  feet, neaps 8 feet.

**Directions.**—A vessel may pass at the distance of one cable to the eastward of Alderman rocks. To clear the foul ground on their north side, keep the telegraph tower on Brow head open north of Driscoll house, on the south side of the harbour.

There is no danger in taking the harbour by day, but at night very great care must be observed to avoid Alderman rocks. In order to clear them, when coming from the southward or westward, a vessel must not steer towards the light before it changes from red to white, on a N.W. by W. bearing; then haul over towards it, and run in on the north shore of the harbour which is bold-to and may be approached to the distance of half a cable.

When running in from the offing for Crookhaven, the opening to which cannot be made out until very near Streek head, steer in from the Fastnet, North; when Brow head closes with Streek head, the harbour will begin to unfold itself, the coast-guard station on the northern shore will first be seen, and ultimately Coghlan (white) tower on the southern side.

A sailing vessel cannot enter Crookhaven with the wind between N. by W. and S.S.W.; but when the wind happens to be foul for Crookhaven, it is fair for Long island sound.

**AMSTERDAM REEF.**—The coast between Crookhaven and Long island sound is deeply indented, and skirted by outlying dangers. Off Ballyrisode point, 2 miles to the eastward of Crookhaven, foul ground extends to the southward for nearly half a mile. Amsterdam reef, awash at low water, is on the outer end of this foul ground, at the distance of

4½ cables S.W. by S. from the point. Ballydiblin house, in line with the west end of Knockafooka hill, N. ¾ W., leads one quarter mile west of the reef; and the corner of the beach at the head of Crookhaven in sight, bearing W. ¼ S., leads the same distance southward of it.

**BULLIGMORE.**—Nearly 3 miles eastward of Crookhaven, off Castle point, which may be known by the ruins of an old square castle, is a cluster of rocks and rocky islets at from 2 to 3 cables distance from the shore, with foul ground extending considerably to the southward and westward of them. The most dangerous portion of this foul ground, called Bulligmore, has two rocky heads, with 3 feet and 12 feet water, respectively. The latter depth is S.W. ¾ S., upwards of three-quarters of a mile from Castle point, and W. ¼ N. about the same distance from Turf island, with the three-foot pinnacle nearly midway between it and the latter. To the westward of these dangers, and bearing W. ¾ S. from Turf island are two rocky patches, Carthys ledge with 6 fathoms, and Outer patch with 10 fathoms, and with 16 to 24 fathoms around them.

To pass southward of Bulligmore the south-west point of Long island must be kept well open south of Little Goat island. Ballydiblin house, in line with the west end of Knockafooka hill, N. ¾ W., leads westward of it. A stranger must on no account pass the line of these leading marks. At night, by not opening the white section of Crookhaven light, a vessel will pass to the southward of all these dangers.

**LONG ISLAND SOUND,** between Long island and the main, is about 3 cables in width, with good holding-ground, and moderate depth of water, and affords excellent shelter for a large number of ships of light draught.\*

Its navigation is, however, obstructed by several shoal patches. The principal danger, Cush spit, is a bank of gravel, about half a mile to the westward of Copper point, and stretching from the island nearly half way across to the main land, with but 4 feet water on its north edge, which is steep-to and marked by a *black* buoy. The tower on Brow head, in line with Gun point, clears it in 7 or 8 fathoms. To the westward of the Cush the depths decrease, at about half a mile distant from it there is a bank with 15 feet water in the middle of the channel, and 3½ to 5 fathoms on each side of it. Proceeding to the westward the deepest water, 3 fathoms, is on the north side of the channel near Coney island; and between this and Gun point, there is a shallow inlet running up to Croagh river, with some detached rocks at its entrance, which will be avoided by keeping Brow head open of Gun point.

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\* See Admiralty plan of Long Island and Baltimore bays, with views, No. 2,129; scale, m = 3·0 inches.

There are two principal anchorages. The western is about 2 cables to the south-eastward of Coney island, in nearly mid-channel, in 5 fathoms at low water. The eastern anchorage is in mid-channel also, in from 6 to 8 fathoms water, with cape Clear disused lighthouse in line with Copper point, and the tower on Brow head in line with the south sides of Gun point and Coney island. These anchorages possess the great advantage to sailing vessels, that they may put to sea from them in easterly winds, when they could not do so from Crookhaven.

There are three channels of approach to Long island sound, one between Goat island and Turf island, called Man-of-War sound; another between Goat island and Long island, called Goat island sound; and a third to the eastward of Long island, between it and Castle island grounds.

**Goat Island**, to the eastward of Turf island, with rocky shores rising to the height of 109 feet, and a channel into Long island sound on either side of it, is remarkable for a deep chasm, which almost insulates its southern portion called Little Goat island, on which a stone beacon has been erected to enable the mariner to distinguish more readily the entrances to Long island sound.

**Long Island**, from which the anchorage within it derives its name as well as shelter, is 2 miles long and about one quarter mile wide, with an elevation near the middle of 97 feet, from whence it declines to the low shelving point at its east end, called Copper point, which is marked by a stone beacon.

**BUDALOGH SHOAL**.—The outer shores of Long island are generally clear to the distance of half a cable, except near the eastern end, where Geenwan rocks (always visible) extend off one cable, and beyond them Budalogh shoal, a rocky patch with 4 fathoms water, stretches  $2\frac{1}{2}$  cables to the south-east. Streak head kept open of Goat island leads to the southward; and the summit of mount Gabriel in line with Copper point leads eastward of it.

**CASTLE ISLAND GROUNDS** extends from the west end of Castle island for a distance of half a mile. Amelia rock, on its outer end, with only 7 feet water, is marked by a *red* conical buoy moored  $1\frac{1}{2}$  cables to the westward of the rock, in 10 fathoms water. Cosheen crag and Barnacleeve gap in line, N.N.E.  $\frac{1}{4}$  E., leads westward of it.

**SKULL HARBOUR**, half a mile within the eastern point of Long island, at the foot of mount Gabriel, is free from danger excepting one rock (the Bull) about midway between the points of entrance, and affords excellent anchorage for vessels of moderate draught. The depth of water in the middle of the harbour is from  $3\frac{1}{2}$  to  $4\frac{1}{2}$  fathoms, with good holding-ground, shoaling gradually on all sides to the shores.

There is a daily post at Skull; supplies, though not plentiful, are more abundant than at Crookhaven, and may be obtained from the town of Skibbereen, distant 13 miles. Except in very dry weather water may be easily procured.

**Bull Rock** covers at half-tide, when its position is pointed out by an iron perch erected on the south-west part of the rock, from which it runs off to the N.N.E. about 350 feet, leaving a channel of a cable in breadth between it and the rocky ledges that extend nearly a cable from Cosheen point.

**TIDES.**—It is high water, full and change, at Skull, at 4h. 2m.; springs rise  $9\frac{3}{4}$  feet, neaps  $7\frac{1}{2}$  feet. Through Man-of-war and Goat island sounds the ebb stream sets to the northward, and the flood to the southward, at the rate of  $1\frac{1}{2}$  knots on springs. In Long island sound the tide sets fairly through, at  $1\frac{1}{4}$  knots on springs.

**Directions.**—Approaching from seaward, neither Goat island nor Long island can in the first instance be clearly discerned, owing to their proximity to the mainland, with which they appear identified. Fastnet rock, however, kept S.S.W.  $\frac{1}{4}$  W., or Leamcon tower N.N.E.  $\frac{1}{4}$  E., will lead directly to Goat island.

When entering Long island sound by Man-of-war sound, a vessel has merely to keep a mid-channel course all the way through to the anchorage.

In Goat island sound it is necessary to keep one-third nearer the Goat island side to clear Sound rock, and not make too free with the south side of Goat island, as foul ground extends a cable from it.

Coming from the westward or south-westward, and intending to enter Long island sound by the eastern passage, between Long island and Castle island grounds, range along the southern side of Long island, giving the shore a berth of half a mile, or keep Streek head open of Goat island, until the summit of mount Gabriel appears open of Copper point, when haul up towards it. If the wind is scant take care not to stand farther to the eastward than to bring Cosheen crag on with Barnacleeve gap, to avoid Castle island grounds. The Roman Catholic chapel at Skull in line with the perch on Bull rock at the entrance of Skull harbour, leads through the eastern entrance clear of all dangers, but rather close to Copper point; having rounded the latter, prepare to anchor, as before directed.

The directions for entering Long island sound by the east entrance are of course applicable to the approaches to Skull. Bull rock may be passed on either side, the outer or western tangent of cape Clear in line with Copper point, leads eastward of it; and the gap in cape Clear island in line with the same point, leads to the westward of it: select an anchorage according to draught of water.

**LONG ISLAND BAY**, comprised between Long island to the northward and cape Clear island to the southward, is so choked with islets rocks, and shoals, as scarcely to be considered navigable water. The outer islet, named West Calf, with deep water close home to its western point, is the westernmost of three small rocky islets named West, Middle, and East Calf. To the northward of these there is a nest of rocks, having Carthy island at their west extreme; between these rocks and Castle island there is a clear passage leading to Roaring Water bay; and between Calf islands and cape Clear there is another passage leading to the Ben or Skibbereen river. Vessels may also pass to the eastward of East Calf, or between it and Middle Calf; but all these channels abound in dangers requiring local knowledge for their safe navigation.

**ROARING WATER BAY** is an extensive shallow inlet at the north-east extreme of Long Island bay, which, notwithstanding its forbidding name, affords quiet and well-sheltered anchorage to vessels under 12 feet draught, being completely sheltered from the sea by the rocks and islands to the westward of it.

The outer anchorage in Roaring Water bay is with the east end of Horse island bearing from N.  $\frac{1}{4}$  W. to N.W.  $\frac{3}{4}$  W., in  $3\frac{1}{2}$  to 4 fathoms water, sand and mud. Better shelter will be obtained by running half a mile farther to the north-eastward, keeping Keown and Knock points in line, N.E.  $\frac{3}{4}$  N., and anchoring on this line of bearing as soon as Tober point touches Mannin island, bearing E.  $\frac{3}{4}$  N., in  $2\frac{3}{4}$  fathoms, mud. This latter mark leads northward of a mud flat, with 9 and 10 feet water, which extends across the bay from the south shore. If desirous of proceeding to the inner anchorage, keep the mark on until within a cable of Ardillaun islet at the west end of Mannin island, and then run along the south side of the latter at about a cable's distance, which will lead between it and the flat extending from Vyglash rocks, until Kilcoe castle bears between N.W. by N. and N.W. by W. when anchor in 16 feet water, muddy bottom. There is also anchorage to the southward of Vyglash rocks, in  $3\frac{1}{2}$  fathoms water.

The clearest and most direct channel into Roaring Water bay is between Carthy island and Castle island, steering about East from the latter position and keeping Bininy island closing on Carthy island cliffs until the west end of Horse island bears N.  $\frac{1}{4}$  W., in order to clear Moore rock with 9 feet water. The same course will lead to the outer anchorage off the east end of Horse island. If desirous of going to the inner anchorages, when Keown point opens of Knock point, N.E.  $\frac{3}{4}$  N., haul up towards it, and proceed as before directed. A vessel may also approach Roaring Water bay from the southward of Calf islands, passing to the eastward of or between them; but these channels are beset with dangers, and should

not be used by a stranger unless compelled by necessity to do so, when the Admiralty chart of Long island and Baltimore bays, No. 2,129, will be found his safest guide.

**CAPE CLEAR ISLAND**, nearly 3 miles long, in an E. by N. and W. by S. direction, and one mile broad, is high, precipitous, and bold, especially on its south side, where it rises abruptly from the sea to the height of 522 feet, but slopes more gradually to the northward. There are two small coves in the island, one on the north side, the other on the south, denominated North and South harbours, but neither of them affords permanent shelter or common convenience to vessels larger than the Irish hookers, though they may be, and indeed have been, made useful to others in cases of great emergency. The south cove is the more extensive as well as deeper, but in boisterous weather, from any quarter to the westward of N.W. or eastward of N.E. the reflux of the sea is so powerful as to draw vessels from both to sea, however well secured they may be.

The old disused lighthouse stands midway on the south side of the island ; the light has been superseded by the one now exhibited on Fastnet rock.

The west and southern shores of cape Clear island are steep and bold-to, there being not less than from 10 to 20 fathoms water at a cable from them. Along the north shore also for about 2 miles from the cape, the shore is clear and steep-to at one cable off, but from thence a series of rocks, terminating in Bullig reef, extends about two-thirds of a mile in a northerly direction, to clear which keep the old telegraph tower to the eastward of Baltimore harbour, in line with Sherkin chapel (*white*), E. by S.  $\frac{1}{2}$  S.

**GASCANANE SOUND**.—This dangerous passage between cape Clear island and the Badger, a small island off the south-west end of Sherkin island, is divided into two channels by Carrigmore and Gascanane rocks ; the former never covers, the latter covers at half-flood. The best channel is between these rocks and Badger island, in a depth of from 22 to 26 fathoms.

The tides sweep through both channels, especially at springs, with such velocity as to cause dangerous eddies ; no sailing vessel should, therefore, attempt the sound without a commanding breeze ; indeed it is seldom used except by steam-vessels bound round Mizen head, when a slight saving of distance is effected.

**BALTIMORE HARBOUR**, between Sherkin island and the main, is very shallow, but affords secure anchorage for a large number of vessels under 10 feet draught, and sufficient shelter just within the entrance for four or five ships drawing from 18 to 20 feet. To a vessel embayed

between Stag rocks and cape Clear, in a southerly gale, it offers the only chance of safety, as Gascanane sound is then impracticable. There is always a ground swell in the harbour with the wind between W. by N. and S.E., which increases considerably in boisterous weather.

The outer anchorage is directly within and opposite the entrance, along the shores of Sherkin island, where are from 3 to 4 fathoms water, on mud and sand, off a very conspicuous ruin of an abbey, which may be brought to bear about W.  $\frac{1}{4}$  S., smaller vessels lie farther eastward according to their draught of water. Those under 9 feet may find good shelter south-eastward of Lousy rocks, between them and the town, being careful to avoid Wallis rock. Or they may take the ground abreast O'Driscols quay, where they will lie on mud. In the outer anchorage, moor East and West, and in the inner one, N.W. and S.E. The town of Baltimore consists of only a few houses, and all supplies are obtained from Skibbereen, about 8 miles distant. Water can only be procured from the wells in the town.

The entrance between Beacon point to the eastward, and Barrack point on Sherkin island, is only  $1\frac{1}{2}$  cables wide, and is not easily made out at any considerable distance. But on approaching it a telegraph tower will be seen about a mile to the eastward, also the ruins of a building over Barrack point, which, with the conspicuous stone beacon erected on the east point of entrance, will clearly point it out.

At the distance of a mile from the harbour there is 20 fathoms water, decreasing to 14 fathoms in the entrance, and shoaling rather abruptly to 5 and 3 fathoms after passing Loo rock.

**Loo Rock**, on the eastern side of the entrance, in a north-westerly direction from the beacon, and nearly one-fourth of the distance across from the eastern to the western point, uncovers at low water spring tides, and is marked by a *black* can buoy, with Loo rock painted on it, moored 20 fathoms south-west of the rock.

The principal dangers within the harbour are Quarry, Lousy, and Wallis rocks.

Quarry rock, 2 cables N.E.  $\frac{1}{4}$  N. from Loo rock, has but 6 feet over it at low water. Lousy rocks, half a mile within the entrance, and near the middle of the harbour, uncover on last quarter ebb, and are marked by an iron perch. The ground is both foul and shallow for about a cable to the northward and westward of the perch. To the eastward it is clear, but the depth is under 2 fathoms. Wallis, or Harbour, rock is a small patch nearly midway between Lousy rocks and the town of Baltimore, but rather nearer to the former; at low water there is  $6\frac{1}{2}$  feet over it; its position is marked by a *black* can buoy. There are other ledges of rocks in different parts of this harbour, but their contiguity to the land, or their distance from the anchoring ground, renders a description of them unnecessary.



**TIDES.**—In Baltimore harbour, it is high water, full and change, at 4h. 23m. ; springs rise  $10\frac{1}{4}$  feet, neaps  $8\frac{1}{4}$  feet.

**Directions.**—To enter Baltimore harbour in a sailing vessel a leading wind is necessary ; steer boldly in N.N.E.  $\frac{1}{4}$  E., without being discouraged by the threatening aspect of the cliffs, and keeping rather towards the western shore, in order to avoid Loo rock. As soon as the entrance has been passed, a large basin presents itself to the eastward ; but the anchorage space for the larger class of vessels is confined to the shores of Sherkin. When Baltimore new church appears in sight over the sandy beach, on the starboard hand going in, a vessel will be considerably to the northward of Loo rock, and if proceeding up off the town, must take care not to come to the eastward of N.E.  $\frac{1}{4}$  N., until the town appears open of Connor rock point, in order to avoid Quarry rock. Winds from the southward of East or West will prove leading winds in, and those which blow from a northerly direction are fair winds out.

**SKIBBEREEN or ILEN RIVER** is a narrow stream running in a north-easterly direction towards the town of Skibbereen, situated  $7\frac{1}{2}$  miles from its entrance. The best and most frequented passage into this river, is directly opposite the entrance of Baltimore harbour between Sherkin island and Spanish island, and is called the Sound ; it is not more than three-quarters of a cable wide, but is deep.

The river may also be entered to the northward of Sherkin island, but both channels are intricate, and should not be attempted without a pilot.

The usual anchorage is in the first reach, under Turk head, and from thence about half a mile to the eastward, where vessels may lie in safety in from 9 to 5 fathoms at low water. Coasters, however, can at half-flood go 4 miles higher up, to as far as Old Court, which is only  $2\frac{1}{2}$  miles from Skibbereen. Here they will have to lie aground, except at a rocky point close to the old castle, alongside which they may moor in 11 feet at low water. This river is greatly neglected, but capable of being much improved.

**The COAST** eastward of Baltimore harbour is high, rocky, and barren, and free from hidden dangers.

**Kedge Island** is a high flat-topped rocky islet,  $1\frac{1}{2}$  miles to the south-east of Baltimore harbour. A chain of pinnacled rocks extends from the islet towards the shore, leaving a narrow passage with 4 fathoms water close along by Spain point, which is sometimes used by coasters.

**Barlogue Harbour**, a remarkable little creek between precipitous hills,  $2\frac{1}{2}$  miles to the eastward of Kedge island, is frequented by a few fishing boats, but affords no shelter with southerly winds. A narrow channel, 400 yards in length, connects it with lough Hyne, a large sheet of water, with a depth of from 10 to 22 fathoms, with which the external waters are

on a level at half-tide only, at other periods of the tide there is a rapid in the narrow channel.

Between Barlogue and Toe head there are two deep indentations, called Tragomna and Toe head bays. They afford no shelter or anchorage.

**TOE HEAD** is a bluff bold headland, with an old telegraph tower on its eastern side, a little within which, at Beenteeane hill, the land rises to the height of 356 feet. The coast in its vicinity is high, barren, and rocky. To the westward of the head, foul ground extends to nearly 2 cables from the shore.

**Scullane Bay**, on the eastern side of the head, is exposed to the south-east, but clear of danger, with soundings decreasing gradually towards the shore over a clean sandy bottom. Horse island, with Black rock lying off it, forms its eastern limit. The latter is 72 feet high and bold-to; round it is the entrance to Castlehaven.

**STAG ROCKS** form a cluster of rugged, precipitous rocks, of 66 feet elevation. When viewed from the westward they appear like pinnacles. They are moderately steep-to, and free from outlying danger. The sound between them and Toe head affords a safe passage, 6 cables in width, and with a depth of 20 fathoms water, rocky bottom.

**CASTLEHAVEN**, about 3 miles to the north-east of Stag rocks, is of small extent, and affords but limited shelter for vessels of a light draught of water. The entrance between Horse island and a remarkable high flat rock called Skiddy island, to the eastward of it, is about 4 cables wide and free from danger. Reen point, to the northward of Skiddy island, is skirted by rocky prongs; and just within the point, at half a cable from the shore, is a rocky head called Colonel rock. The depths decrease gradually from 5 fathoms abreast Reen point to  $1\frac{1}{2}$  fathoms opposite the village of Castletownsend, which stands about a mile within the entrance. Supplies are brought from Skibbereen, 5 miles distant. Water may be procured, but not in abundance.\*

The harbour is not adapted to vessels of more than 12 feet draught, for they would be obliged to anchor so far out as to be exposed to the heavy swell that sets in with southerly winds; and although vessels of a lighter draught may go far enough up to be landlocked, they gain no better shelter, for the swell rolling against the western shore is deflected towards the head of the harbour with such force as to cause them to strike heavily on the hard sandy bottom.

**TIDES.**—It is high water, full and change, at Castletownsend, at 4h. 21m.; springs rise  $10\frac{3}{4}$  feet, neaps 8 feet. Neither the ebb nor flood stream possesses any strength.

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\* See Admiralty plan of Castlehaven and Glandore harbour, No. 2,092; scale,  $m = 3$  inches.

**Directions.**—Steer in between Horse island and the Skiddy, with two white mounds of stones in line, bearing North, until Stag rocks appear between Horse island and the main, when proceed up the harbour, keeping the Stags in one with Flea island on the west side of the sound, to avoid Colonel rock. Or, in the event of the mark not being seen, keep as near mid-channel as practicable, and anchor as most convenient, according to draught of water.

**HIGH ISLAND**, of 150 feet elevation, is the largest and outermost of a cluster of rocks lying nearly one mile off shore to the eastward of Castlehaven, and midway between it and Glandore harbour. High island is steep to the southward, but the group must not be too closely approached from any other quarter.

**GLANDORE BAY**, between High island and Galley head,  $6\frac{1}{2}$  miles to the eastward, embracing Glandore harbour and several small fishing creeks, is generally foul and rocky near the shore.

**Rabbit Island**, N.N.E.  $\frac{3}{4}$  E. over  $\frac{3}{4}$  of a mile from High island, forms the east shore of the small harbour of Squince, where fishing vessels find good shelter in westerly winds. There is also a little inlet between Castlehaven and Squince, called Blind harbour, fit for boats only.

**Belly Rock**, awash at low water springs, is  $1\frac{1}{2}$  cables to the southward of the rocks that extend from the west end of Rabbit island, and is in the track of vessels taking the channel between High islands and the shore, which otherwise presents a clear passage, from 7 to 14 fathoms deep.

Castle Freeke house, open to the southward of Downeen point, E.  $\frac{1}{4}$  N., or Black rock, in line with north peak of Beentecane hill, West, leads southward of Belly rock. Sheela point, open to the eastward of the Beanstack, N.E.  $\frac{3}{4}$  N., leads eastward of it.

**GLANDORE HARBOUR**, although open to the southward, offers better riding for small vessels than Castlehaven, as it is protected from the force of the sea by the islands and rocks that lie in the entrance.

The best anchorage is off Coosaneigh point, in from 2 to 3 fathoms water. Vessels of less than 12 feet draught may run up half a mile farther at half-flood, and anchor off Ballincalla house, where they will lie in safety in from 7 to 9 feet water on soft mud. There is little stream of tide in this harbour. The village of Glandore stands in the north-east bight of the harbour, where is a small rubble pier for the convenience of landing. Supplies of provisions may be obtained in small quantities, and water from the streams that trickle down the hill sides.

The entrance, 2 miles north-eastward of High island, may be easily distinguished by an old telegraph tower, standing on the cliffs of Foilnashark head, the east point of entrance, at an elevation of 259 feet.

**Adam Island**, 99 feet high, lies one-quarter mile off Sheela point on the west side of the entrance. The passage between them is unsafe, it being obstructed by a rock lying in mid-channel with 11 feet water. To the northward of the island foul ground extends for a cable, but to the eastward of it the passage is clear of danger, and about 4 cables wide, with from 9 to 12 fathoms water.

Half a mile within Adam island is a smaller islet, 23 feet high, called Eve, which may be passed on either side; but the wider and more direct channel is to the eastward of it.

**The Dangers.**—Within Eve island, and about mid-channel of the harbour, is a chain of rocks, extending upwards for about 4 cables, called the Dangers. The northernmost of these, named the Sunk, has 6 feet over it at low water; the other rocks uncover, and are marked by perches. They are all steep-to with deep water between them, and a channel of not less than 18 feet depth on either side, of which the western is the best.

**Directions.**—To enter this harbour, run up to the eastward of Adam and Eve islands, keeping near mid-channel. When above the latter islet, bring its east extreme on with the west extreme of Adam island, which will lead through the channel to the west of the Dangers. Kept a little open these marks lead to Sunk rock. When the coast-guard flagstaff is seen over Coosaneigh point a vessel will be to the northward of the Dangers, and must prepare to anchor. In proceeding through the passage to the east of the Dangers, keep about half a cable from the east shore. The east cliff of Adam island in line with the south-east perch leads eastward of the Sunk. With a beating wind both shores must be approached with caution, as they are foul to some distance.

**ROSSCARBERRY BAY**, at the east side of Glandore bay, is generally foul and dangerous to approach. Rosscarberry inlet is all dry at low water, and scarcely worthy of notice. At high water the entrance is 100 yards wide, beyond which it expands and runs up about one mile to the town of Rosscarberry, a place of no trade, and frequented only by small coasters bringing coal and timber.

South-eastward of this inlet are two sandy beaches, separated by the rugged cliffs of Cloghna head. The southernmost of these, called Long strand, forms a remarkable feature of the coast; from its southern end there commences a bold rocky shore which reaches to Galley head.

**Cloghna Rock**, a pinnacle with 4 feet water, and steep-to all round, is half a mile distant from the shore, in front of Long strand, and is the most outlying danger in Rosscarberry bay. The spire of Rosscarberry cathedral just open of Creggan point, the eastern limit of Rosscarberry harbour, leads  $1\frac{3}{4}$  cables westward of it.

**Dhulic Rock**, half a mile W.  $\frac{1}{4}$  S. of Galley head, and awash at high water, is steep-to on the north and east, but to the south-west of it foul ground extends for  $1\frac{1}{2}$  cables. The ebb tide sets on it with great velocity. The mark given to clear Cloghna rock, viz., the spire of Rosscarberry cathedral just open of Creggan point, leads between Dhulic rock and Galley head in from 11 to 13 fathoms water.

**White Rock**,  $1\frac{1}{8}$  mile S.W.  $\frac{3}{4}$  W. from Galley head, has 11 fathoms water over it.

**Robber Rock**, W. by S.  $\frac{3}{4}$  S.  $2\frac{1}{2}$  miles from Galley head, is said to have as little as 4 fathoms water over it, but 8 fathoms is the least depth that has hitherto been found upon it.

**GALLEY HEAD**, of 122 feet elevation, makes like an island when viewed from the east or west.\* The ruin of Dundeady castle is on the low neck that connects it with the main. There are several dangerous rocks southward and westward of the head; those to the westward have already been described.

**Clout Rocks**, with 5 fathoms water, are S.  $\frac{3}{4}$  E. 4 cables from Galley head. Half-way between Clout rocks and the head is another shoal called Inner Clout, with  $3\frac{1}{2}$  fathoms water; around these rocks there are from 10 to 12 fathoms water.

**Dirk Bay**, immediately to the eastward of Galley head, affords good anchorage for small vessels, with westerly winds, abreast a coast-guard station on the west side of the bay, in from 3 to 4 fathoms, fine sand. On the eastern side of the bay is Carrigduff rock, covered at half-tide, with foul ground to the south-westward of it for nearly a cable. Bream rock, another small patch,  $2\frac{1}{2}$  cables S.E.  $\frac{3}{4}$  E. from the coast-guard station, has not less than 4 fathoms over it at low water. The anchorage is within this rock.

Between Dirk bay and Dunnycove bay, a distance of  $1\frac{1}{2}$  miles, the shore is skirted by several patches of foul ground, known as Cow, Keameen, and Bellows, rocks, with from 4 to 7 fathoms water over them, all of which may be avoided by not coming within half a mile of the shore.

**Dunnycove Bay** is clean and level, affording good anchorage, with westerly winds, in from 5 to 7 fathoms, fine sand; but it is open to the south-east.

**CLONAKILTY BAY**† is included between Galley head and Seven heads, a distance of  $9\frac{1}{2}$  miles, in an E.  $\frac{3}{4}$  S. direction. With the exception of half a mile of sandy beach, which marks the entrance to Clonakilty harbour, the shores are generally high and rocky, and fringed with outlying rocks and foul ground.

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\* A lighthouse is in course of erection on Galley head. (1876.)

† See Admiralty plan of Clonakilty bay, No. 2,080; scale,  $m = 3$  inches.

**Anchor Rock**, with 8 feet water, E. by N.  $\frac{3}{4}$  N.  $3\frac{1}{4}$  cables from Duneen head, is in the track of vessels from the westward bound to Clonakilty harbour. Sheep rock, with 4 feet water, is half a mile to the eastward of Clonakilty harbour, and 2 cables off shore ; to the eastward of this the shore becomes very foul. Sloop rock, with 12 feet, is about 3 cables off, and for a cable outside it there is not more than 4 fathoms water.

**Dunworley Bay**, a small bight encumbered with rocks and foul ground, has Cod rock, with 4 fathoms, in front of it, at the distance of more than half a mile from the shore. The soundings in the outer part of Clonakilty bay are very irregular, with several rocky patches of from 7 to 10 fathoms water. Large vessels should not stand towards it nearer than the depth of 20 fathoms, or, in thick weather, 30 fathoms.

**TIDES.**—It is high water, full and change, at Clonakilty bay, at 4h. 30m. ; springs rise 11 feet, neaps  $8\frac{1}{2}$  feet.

**CLONAKILTY HARBOUR**, which is for the most part dry at low water, is in the bight of Clonakilty bay, with its entrance at the east end of the sandy beach already referred to. The entering channel, in which there are some holes with 10 and 12 feet water, runs close along by the high land of Ring head ; the bar at the entrance has not more than 2 feet on it at low water. Immediately within it is Wind rock, lying close to the shore of Ring head, and just awash at high water ; the channel runs close to it. Three-quarters of a mile within Ring head, at the small village of South Ring, is a pier with 6 or 7 feet water at its head, where vessels generally lie.

The town of Clonakilty is at the head of the harbour, 2 miles above South Ring, where is a depth of 5 to 6 feet over the mud flats at high water spring tides.

This harbour is unfit for any but the smallest class of vessels, and the heavy sea on the bar, with southerly winds, renders it impracticable even for these at such times. With off-shore winds vessels waiting for tide to enter the harbour will find good anchorage outside the bar, with regular soundings to the shore on a clean sandy bottom.

**SEVEN HEADS** is a bold bluff headland, with an old telegraph tower upon it. The bottom around the head is uneven and rocky, causing overfalls during the strength of the tide. Baun bank, with 6 fathoms water, half a mile to the eastward of the head, and Carrigroar rock with 5 fathoms,  $1\frac{1}{2}$  miles from the shore in the same direction, break in bad weather. Cotton rock, awash at high water, is  $1\frac{1}{2}$  cables from the shore on the east side of the head.

**COURTMACSHERRY BAY**,\* between Seven Heads and Old Head of Kinsale, a distance of 7 miles in an E.  $\frac{1}{4}$  S. direction, is dreaded by coasters, from its exposed aspect, and the dangerous rocks that encumber it. Its western shores afford good shelter in westerly winds; and in its north-west corner is Courtmacsherry harbour.

**Seven Heads Bay**,  $1\frac{1}{2}$  miles to the north-eastward of the head, affords shelter from westerly and northerly winds, in from 6 to 9 fathoms, good holding-ground. Its north shore rises almost perpendicularly to the height of 352 feet, from whence it falls rather abruptly to Barry point.

**Broad Strand Bay**, half a mile to the northward of Barry point, affords good shelter from westerly and south-westerly winds, in 4 fathoms, fine sand.

The most outlying dangers in Courtmacsherry bay, besides those already described, are Horse, Barrel, Black Tom, and Blue Boy, rocks.

**Horse Rock**, awash at high water, is 4 cables E.  $\frac{1}{4}$  S. of Barry point, with a clear passage of 6 to 8 fathoms water between them.

**Barrel Rocks**, near the middle of the bay, consist of two patches, the outer rock,  $1\frac{1}{4}$  miles distant from the north shore, covers on last quarter flood; it is marked by a perch. The rock is steep to the southward, but foul for some distance to the north-eastward of the perch. Between these rocks and the north shore is another large patch of foul ground, called the Inner Barrels, which rarely uncovers. There is a passage between these rocks, also between the latter and Breen rock, which is an outlier from the foul ground skirting the north shore, with  $2\frac{1}{2}$  fathoms over it.

**Blue Boy** and **Black Tom** are both pinnacle rocks; the former with 2 feet water, is E.S.E., 4 cables from the perch on Barrel rock; the latter, with 9 feet water, is W. by N.  $\frac{1}{4}$  N. 6 cables distant from the same. Lislee church, in line with the west house of Lislee village, and just open to the northward of Horse rock, N.W. by W.  $\frac{1}{2}$  W., leads outside or southward of these dangers. By night, the north-east or inner limit of the sector of red light from Old Head of Kinsale lighthouse, leads nearly in the same line of direction.

The east shore of Courtmacsherry bay is fringed with rocky ledges, which extend off upwards of 2 cables. In its eastern bend is a long sandy beach, but the ground is foul in front of it, and it cannot be recommended for anchorage, on account of the danger of becoming embayed with southerly winds. From this to Old Head the shore is bolder, and free from outlying danger.

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\* See Admiralty plan of Courtmacsherry bay, No. 2,081; scale,  $m = 3$  inches.

**Courtmacsherry Harbour**, although only adapted to small craft, derives importance from its position in the bight of this dangerous bay, and had it been formerly better known, might have been the means of saving much life and property. It may readily be distinguished by Land point, which is high and well defined, with an old summer-house over it, on the south side of the entrance. The north shore is formed of sand-hills, and skirted by extensive flats, leaving a channel scarcely more than one cable in width between them and the south shore, where only vessels can lie afloat. A *black* conical buoy lies in 10 feet, at low water springs, at the south-east edge of the spit on the north side of the entrance.

The water shoals gradually inwards from the bay to 10 feet abreast Land point. In southerly gales, however, it breaks heavily about the entrance. Within the point it deepens to 12 feet for the distance of one-third of a mile, when occurs an inner bar with 9 feet water, and within it a hollow with 15 feet water, where a vessel may ride safely, by anchoring about one-third over towards the north shore, and carrying out a kedge to the southward.

The village of Courtmacsherry is a mile within the entrance, with no trade beyond a few coasters, and affording no supplies. Above this the harbour expands, and at low water presents a considerable area of mud and sand extending 2 miles westward to the village of Timoleague.

**Life-boat.**—A life-boat is stationed at Courtmacsherry.

**TIDES.**—It is high water, full and change, in Courtmacsherry harbour, at 4h. 36m.; springs rise  $10\frac{1}{2}$  feet, neaps  $8\frac{1}{2}$  feet.—At springs the stream is very strong.

**Directions.**—Vessels from the westward, bound into Broadstrand bay, or Courtmacsherry harbour, may pass between Barry point and Horse rock. To do so, bring Harbour-view house mid-way between them, N. by E.  $\frac{1}{2}$  E., and steer directly for the house, keeping Land point a little on the port bow. From the eastward, keep Lisle church in line with the west house of the village, and just open north of Horse rock, until the top of Burren hill is shut well in behind Land point, N. by W.  $\frac{1}{4}$  W., and run in with it on that bearing between Black Tom and Horse rocks, until within half-a-mile of Land point. The extremes of Coolmain point and Land point in line, N.W.  $\frac{1}{4}$  W., leads northward of Inner Barrels, and between them and Breen rock, a passage only to be used in case of necessity.

Land point is bold-to, and may be rounded very close, leaving the spit *black* buoy on the starboard hand. The inner bar being sheltered from the heave of the sea, will generally admit of a vessel crossing it at the same height of tide she does the outer one. But care must be taken not to run for the harbour until there is sufficient water to carry a vessel over the



outer bar, where she will find not more than 10 feet at low water springs. Large vessels standing towards Courtmacsherry bay must tack in 30 fathoms, or before Old Head light changes colour.

**OLD HEAD OF KINSALE** is a bold projecting headland, bounded by steep cliffs, with a lighthouse at its extremity. Its outer portion of 256 feet elevation is almost insulated; the narrow isthmus that connects it being only 130 yards across, and penetrated by two subterranean passages. The ruin of De Courcy castle stands over the isthmus, and a short distance to the northward of it there is an old telegraph tower.

Four cables N.E. by E.  $\frac{3}{4}$  E. from the lighthouse, and on the east side of the head, is a low-lying flat rock, called the Bream, extending to a cable from the shore, and steep-to; the head is otherwise clear of danger. On the ebb tide there is a race or overfall setting from it in a south-westerly direction, for nearly a mile, and on the flood, to the south-eastward for about the same distance.

In order to fall in with the Old Head, when making from the offing, keep Knockmealdown mountain bearing N.E. by E.

**LIGHT.**—On the extreme point of the head, a tower 100 feet high, painted white with two red belts, exhibits a *fixed white* light at an elevation of 236 feet, visible in clear weather at the distance of 21 miles. A sector of *red* light is shown across the entrance of Courtmacsherry bay, between a line drawn to Seven Heads, and a line to Horse rock, to warn vessels of their approach to its dangers. Within the bay northward of the line to Horse rock, the light appears of the natural colour.

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## CHAPTER II.

SOUTH COAST OF IRELAND.—OLD HEAD OF KINSALE TO GREAT  
NEWTOWN HEAD.

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 VARIATION in 1877.

 Queenstown 28° 20' W., decreasing 9 minutes annually.
 

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From Old Head of Kinsale to the entrance of Kinsale harbour is N.E.  $\frac{3}{4}$  N.  $4\frac{1}{2}$  miles, the intermediate coast being of moderate elevation and free from danger.

On rounding the head, Kinsale harbour comes immediately into view, being easily distinguished by the well defined valley of the river, and by a conspicuous white church at Upper cove, just over Charles fort, bearing N.E.  $\frac{3}{4}$  N.

**KINSALE HARBOUR**,\* formed by the estuary of the river Bandon, affords secure anchorage for small vessels against all winds and sea; but a bar, of 12 to 16 feet water, and narrow channel of less than a cable in width, make it difficult of access to the larger class of shipping. One or two vessels of not more than 18 feet draught, may find safe anchorage outside the bar, abreast Lower cove, with the Old Head touching Prehaun point; a berth that owes much of its security to the shelter afforded by the Old Head.

Within the bar there is good anchorage anywhere in from 4 to 6 fathoms, muddy bottom. Vessels usually bring up abreast Upper cove in from 4 to 5 fathoms, about a cable from the east shore.

Between the town and Blockhouse point there is also good anchorage in 6 to 8 fathoms water, keeping on the town side to avoid the shoal off Blockhouse point; and for one mile above the town vessels may ride in security in from 3 to 5 fathoms water.

The town of Kinsale was, during several centuries, the most important seaport on the south coast of Ireland, but its commerce is now checked by its proximity to the flourishing port of Cork. It is supported chiefly by summer visitors, and the fisheries, which average 500*l.* a week, and

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\* See Admiralty plan of Kinsale harbour and Oyster haven, No. 2,053; scale, *m* = 6·8 inches.

## 24 OLD HEAD OF KINSALE TO GREAT NEWTOWN HEAD. [CHAP. II.]

employ about 600 men and boys. A railway connects the town with Cork. Supplies of provisions and water may be procured. Population in 1871, 4,850.

Charles fort, built in 1670, and named in honour of Charles II., is on the east side of the harbour, about one mile within the entrance.

The west shore of the harbour is generally foul, and must be approached with caution. Farmer rock, about 3 cables within Strookaun point, the north-west point of entrance, and three-quarters of a cable from high-water mark abreast, uncovers at three-quarters ebb, and must be carefully avoided by vessels working in or out.

Above Money point, the west shore is encumbered by an extensive mud flat, which encircles Blockhouse point at the distance of one cable and confines the navigable channel towards the town to the east shore.

**LIGHT.**—A small *fixed white* light is shown at an elevation of 98 feet in the roof of one of the buildings in Charles fort.

**Bulman Rock** is a dangerous rock with 3 feet water, 2 cables S.W. by S. from Hangman point, the south-east point of entrance, it is marked by a *red* can buoy lying  $\frac{3}{4}$  of a cable to the south-west. The sea always breaks upon this rock in bad weather, but it is bold-to, and the marks for clearing it well defined. The white church at Upper cove, open of Prehaun point, N. by E.  $\frac{3}{4}$  E., or at night Charles fort light open of the same, leads to the westward of the Bulman; Blinknure point, open of Frower point, E.  $\frac{1}{4}$  N. (*see* view C., chart 2,053), leads to the southward of it.

There is a clear passage for small vessels between the rock and Hangman point, the leading mark for which is the north end of Big Sovereign island, closing with Frower point, E. by S.  $\frac{1}{2}$  S. (*see* view D., chart 2,053).

**BAR.**—The outer edge of the bar, composed of sand and shingle, runs from Middle cove obliquely across the harbour in the direction of Blockhouse point, until it joins the great western mud flat. The least water, 12 feet, is on its outer edge, right in the fairway. If the channel were buoyed, a vessel might carry 16 feet across the bar. The leading mark now in use leads eastward of the shoal patch in 13 feet.

**TIDES.**—It is high water, full and change, in Kinsale harbour, at 4h. 43m.; springs rise  $11\frac{1}{2}$  feet, neaps 9 feet.

**Directions.**—In running for Kinsale harbour observe the directions given above to avoid Bulman rock. On arriving in the entrance steer about N E. by N., and when approaching Middle cove, bring Fairfield cottage (built in the Elizabethan style,) at Upper cove, over the south-western bastion of Charles fort, N.N.E. northerly, which will lead across the bar in 13 feet water, to the eastward of the shoal patch. Keep in this

direction until at the distance of a cable from the fort, when haul more to the northward, and run along the east shore at about a cable's distance until abreast Upper cove, when prepare to anchor. Or, if bound to the town, continue along the east shore until abreast it, when anchor where convenient for hauling alongside the quays.

At night, bring Old Head light to bear S.W., and steer N.E. until the light in Charles fort bears N.N.E.  $\frac{3}{4}$  E.; which will then lead clear of Bulman rock and to abreast Prehaun point. After passing Prehaun point, keep a little over towards the east shore, crossing the bar in about 12 or 13 feet at low water. Anchor off Upper cove, keeping on the cove side.

Should there not be sufficient water over the bar, or for a vessel seeking temporary shelter, the anchorage at Lower cove offers perfect security; for, although southerly gales send in a good deal of swell, ships always ride there in safety, and when the weather moderates, it is much easier for a sailing vessel to get to sea from this anchorage than from Upper cove.

**The SOVEREIGNS** are two remarkable rocky islets, in front of Oyster haven, which are of great assistance to a stranger in determining his position. The westernmost called Big Sovereign, 92 feet high, at half a mile south-westward of the haven, is precipitous, inaccessible, and bold-to. A cleft, through which a boat may pass, divides it into nearly equal portions. Little Sovereign is about  $1\frac{1}{2}$  cables southward of the east point of the haven, and midway between is a rock with 9 feet water. The islets are otherwise clear of danger, and may be passed at the distance of half a cable.

**OYSTER HAVEN**, at 2 miles to the eastward of Kinsale, and just within Sovereign islets, affords partial shelter to vessels of less than 13 feet draught. Hookers and fishing boats find security in the western branch of the haven, where they lie aground at low water.

The only danger in the way of vessels entering is Harbour rock, with 4 feet water, about half a mile within the entrance, and nearly midway between Ferry point and the opposite shore. The best channel is to the westward of the rock.

The anchorage is north-eastward of Ferry point, at the entrance of the western arm of the haven, in 15 to 20 feet water; but it is very confined, and exposed to a heavy sea with south-westerly winds.

**The COAST** between Oyster haven and Cork harbour, a distance of 9 miles, is high, bold, and rocky. The soundings near the shore are irregular, with some shoal patches, but the only danger in the way of shipping is Daunt rock.\*

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\* See Admiralty chart:—Ireland, sheet XIII., Kinsale to Brattin head, with plan of Ballycottin bay, No. 2,336; scale,  $m = 0.5$  inch.

**Reanie Head**, the most projecting part of the land after rounding **Old Head of Kinsale**, is bold and precipitous, rising perpendicularly to the height of about 140 feet, and remarkable from a number of gate posts, which are more particularly conspicuous when coming from the eastward.

**Flat Head**, two-thirds of a mile westward of Reanie head, is foul to the distance of three-quarters of a mile from the shore. About half a mile E. by S.  $\frac{1}{4}$  S. from Reanie head is a small rocky patch with  $3\frac{1}{4}$  fathoms. **Cork head**, kept open of **Roberts head**, N.E.  $\frac{1}{2}$  E., leads south-eastward of it.

**Roberts Head**, a bluff headland with an old telegraph tower about half a mile to the northward of it, is E. by N.  $\frac{3}{4}$  N.,  $11\frac{1}{2}$  miles from Old Head of Kinsale, and 4 miles south-westward of the entrance of Cork harbour. In **Rocky bay**, at the west side of the head, is a reef called **Carrigadda**, which uncovers to the distance of 3 cables from the shore.

**DAUNT ROCK**, a pinnacle with 10 feet water over it, rising from a rocky bed of about a cable in diameter, lies S.E. by S. distant three-quarters of a mile from Roberts head, S.W.  $4\frac{1}{2}$  miles from Roche point, and E. by N.  $\frac{3}{4}$  N.  $11\frac{1}{2}$  miles from Old Head of Kinsale, and must be carefully avoided by vessels bound to Cork from the westward. A light-vessel is moored  $1\frac{1}{10}$  mile S. by E. from the rock, and a *black* conical buoy lies to the north-eastward with the light-vessel bearing S. by E. In southerly gales the buoy is often washed away. By night, a *fixed white* light shown under the *intermittent white* light at Roche point and visible between the bearings N.E.  $\frac{3}{4}$  E. and N.E.  $\frac{1}{2}$  N., marks its danger limits; the latter bearing leads a short half mile only eastward of the rock.

**LIGHT**.—A light-vessel is moored in 14 fathoms at low water springs,  $1\frac{1}{10}$  mile S. by E. from Daunt rock, and  $4\frac{3}{4}$  miles south-west of the entrance of Cork harbour, from the main mast of which a *fixed red* light is exhibited at an elevation of 39 feet above the sea. The vessel is painted black with a white ribbon and “Daunt’s rock” in white letters on her sides, and she has three masts, with a globe at the main-mast head.

During foggy weather, a gun is fired *twice*, with an interval of *five minutes, every quarter of an hour*. From the light-vessel, Roche point lighthouse bears N.E.  $\frac{3}{4}$  N., distant  $4\frac{1}{10}$  miles; Roberts head, N.N.W.  $1\frac{1}{10}$  miles; and Barry head, W. by N. 4 miles.\*

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\* From the forestay of each light-vessel, under the jurisdiction of the Commissioners of Irish lights, on the coast of Ireland, a *white* light is exhibited from sunset to sunrise, at a height of 6 feet above the rail, for the purpose of showing in which direction the vessel is riding. The regulations of the Commissioners respecting light-vessels out of position, are as follows, viz.:—When a light-vessel is driven from her proper position to one where she is of no use as a guide to shipping, the following signals will be made, viz.:—The usual lights will not be exhibited, but a *fixed red* light will be exhibited at

For the distance of 2 miles southward of the rock, the ground is broken and rocky, with depths varying from 10 to 20 fathoms. In thick weather a ship should not approach nearer than the latter depth, until her position is well ascertained.

There is a clear passage between Daunt rock and Roberts head, with 9 and 10 fathoms water, of which steamers and coasters may take advantage in moderate weather, but in unsettled weather it must not be attempted, as the sea sometimes breaks right across from the rock to the head. The leading mark for the passage is the Little Sovereign in one with Reanie head W.  $\frac{1}{2}$ ° S., or Templebreedy church seen over Morris head, bearing N.E. by N., but large ships should invariably pass outside the rock.

**CORK HARBOUR**, one of the most capacious and secure harbours in the British islands, contains space sufficient for the largest fleets to anchor in moderate depths of water, on good holding-ground, and is most effectually sheltered against all winds and seas. It is, moreover, easy of access, and from its western geographical position, is most valuable as a rendezvous both for Her Majesty's ships, and the immense fleets engaged in commerce, that continually resort here, both for shelter, and to await orders as to their final destination on their homeward voyages. Its spacious anchorages are usually much crowded, necessitating careful pilotage to avoid collision.\*

The principal objects which first present themselves to a vessel approaching Cork harbour from the offing, are the high bluffs of Dogsnose and Ram point. The former on the eastern side of the entrance has Carlisle fort on its summit; and a little to the right of the fort, a remarkable double wall runs down the face of the hill to the sea. Ram point, with Camden fort on its summit, forms the opposite side of the entrance. Templebreedy church (white, with spire), stands conspicuously on the high land south-westward of Camden fort. On a nearer approach, Roche point, with its lighthouse and tower, comes into view.

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each end of the vessel, and a *red* flare shown *every quarter of an hour*. By day, the balls or other distinguishing mast-head marks will be struck. Also, that if from any cause the light-vessel be unable to exhibit her usual lights whilst at her station, the riding light only will be shown.

**NOTE.**—The firing special rockets of an explosive character from a light-vessel will denote the need of assistance from the shore.

When a vessel is observed from the light-vessel, standing into danger, a gun will be fired, and repeated until observed by the vessel, and the two signal flags J. D. of the Commercial Code "*You are standing into danger*," will be hoisted and kept flying until answered.

\* See Admiralty plans, Cork harbour, with views, No. 1,765; scale,  $m = 2.5$  inches;  
 Port of Cork . . . . . „ 1,773; „  $m = 2.0$  „ ;  
 Cork outer harbour and Queenstown road . . „ 1,777; „  $m = 6.8$  „

On rounding Roche point the entrance to the harbour opens, and the four large buoys marking Harbour rock and Turbot bank appear. Harbour rock buoys are *chequered*, and those of Turbot bank *striped*.

These shoals are nearly in the middle of the entrance, and much in the way of large ships working in or out. But there is a good clear passage on each side of them, and also between them.

On passing the entrance, the harbour at once unfolds itself. Its principal features are Spike island, the Government store-houses on Haulbowline island, and the town of Queenstown, formerly Cove of Cork, but honoured in 1849 by Her Majesty's gracious permission to assume the name it now bears.

A comparatively small portion of the wide expanse that now presents itself is available for navigation. The greater part of it being occupied by shallows, between which the deep water channel runs in an N.E. by N. direction, for about  $2\frac{1}{2}$  miles, to the shore of Great island, where it bends abruptly to the westward, until it meets the river Lee a little above Haulbowline, when it again resumes its northerly direction.

**Supplies** of every kind can be procured at Queenstown or from Cork, and any repairs may be accomplished at as little cost as in any part of the United Kingdom, the graving docks at Passage, and on the opposite shore, affording every facility for the repair of first-class ocean steamers. Water is supplied to men-of-war by the Government tank vessel; to merchant ships by private tanks, for which a charge is made according to distance. Coal is shipped alongside the quays at Haulbowline island.

Constant intercourse is kept up between Cork and Queenstown by rail and steam-vessels. There is also steam communication with most of the great commercial ports, and by electric telegraph with all parts of the kingdom.

**Time Signals.**—There are two time guns, one at Queenstown, the other at Cork, which are fired daily at one o'clock p.m., Greenwich mean time.

Telegraphs and a code of signals for Cork harbour have been established to communicate with vessels in the offing, so that as soon as a vessel homeward bound, or otherwise, makes her number off the harbour, it will be almost immediately known in Cork.

**Graving Docks.**—The port of Cork is provided with three graving docks, two of which are at Passage, and the third on the Queenstown side of the river opposite Monkstown. The latter dock is 480 feet long, 59 feet wide at the gates, and has 17 feet over the sill. The larger of those at Passage is 400 feet long, 81 feet 6 inches wide at the gates, and with 23 feet over the sill at spring tides; the smaller dock is 200 feet in length by 60 feet in width, it is now used as a boat harbour, and dries at low water.

There are also two patent slips at Cork for vessels of from 250 to 300 tons.

**Pilots** cruise between Ballycotton island on the east and Old Head of Kinsale on the west. Their boats are distinguished by the words "Cork pilot" on the sail. The little village of Geileen, in Poor Head bay, is the resort of most of the eastern pilots, who, on the usual signal being made, go off in almost any weather.

The rates of pilotage, from sea to Queenstown, range from 11*s.* 3*d.* for a vessel under 80 tons to 5*l.* 12*s.* 6*d.* for one of 1,000 tons; with an increase of 6*s.* for every additional 100 tons or surplus fraction (not being less than 50 tons) of every 100 tons, up to and including 2,000 tons surplus; and for every 100 tons, or like fraction of 100 tons, over 2,000 tons surplus, as far as a vessel of 5,000 tons inclusive, 3*s.*

Steam tugs are always on the look-out for vessels requiring their assistance.

**Life-boat.**—A life-boat is stationed at Queenstown.

**LIGHTS.**—**Roche Point Lighthouse**, on the east side of the entrance to Cork harbour, is a circular white tower enclosed within long white walls, and exhibits, at an elevation of 98 feet, an *intermittent white* light which shows bright for *fifteen seconds*, and is then suddenly eclipsed for *five seconds*: it is visible in clear weather at the distance of about 10 miles. A *fixed white* light is also shown 38 feet below the intermittent light, between the bearings N.E.  $\frac{3}{4}$  E. and N.E.  $\frac{1}{2}$  N., to mark the danger limits of Daunt rock.

In thick or foggy weather a bell is sounded at intervals of *thirty seconds* or *twice in each minute*.

**Spit Light.**—A pile lighthouse erected on the eastern projection of Spit bank, in 9 feet water, exhibits at an elevation of 32 feet, a *red fixed* light between the bearings N.N.E.  $\frac{1}{2}$  E., round by west and south, to S.E. by E.  $\frac{1}{2}$  E.; it is visible at the distance of 5 miles.\*

**POOR HEAD**, 3 miles south-eastward of the entrance of Cork harbour, is foul to some distance off; Hawk rock, with 10 feet water, is 2 cables, and Quarry rock, with 3 feet,  $1\frac{1}{2}$  cables distant from the head. Poor head bay on the west side of the head has a clean shingly beach, and is the only spot between the head and Roche point, where it would be advisable to beach a boat or small vessel in case of necessity. Between Poor head and Roche point the bottom near the shore is foul and rocky, and must be approached with caution by large ships. Abreast Roche

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\* Arrangements will shortly be made for showing a sector of *white* light from Spit light-house, between the bearings S.W.  $\frac{1}{2}$  S. and S.W. by W.  $\frac{1}{2}$  W., to cover Bar rock.



tower there is not more than 21 feet water at the distance of one-third of a mile from the shore.

**POLLOCK ROCK**, a danger to be carefully avoided by ships of heavy draught approaching the harbour from the eastward, is S.E.  $\frac{1}{4}$  S., about  $1\frac{1}{4}$  miles from Poor head, and nearly  $1\frac{1}{2}$  miles from the nearest shore. It consists of a ridge of rocks, about 400 feet in length, on which the least water found by the Admiralty surveyors was 26 feet. The fishermen, however, state that it has as little as 18 feet. The west end of Geileen village open of Poor head, N.N.W.  $\frac{3}{4}$  W., leads 3 cables south-west of the Pollock; Capel island, open of Ballycottin island, E. by N.  $\frac{1}{2}$  N., leads three-quarters of a mile southward of it; and Roche tower, in line with Poor head, N.W. by W., will lead within it. The ground around the ridge, and between it and the shore, is rocky and uneven. Approach it no nearer than the depth of 13 fathoms.

**Cow and Calf Rocks**, under Roche point, and to the south-west of the lighthouse, although close to the shore, require caution on the part of a vessel rounding the point at high water. The Cow is nearest the shore and never covers. The Calf, at the distance of a cable from the lighthouse, appears at low water only, and is steep-to. The tower on Haulbowline island, in line with the outer face of Camden fort, N.  $\frac{3}{4}$  W., leads westward of it.

**Harbour Rock**, in the middle of the entrance, just within Roche point, is an extensive rocky shoal, with depths varying from 15 to 30 feet, the shoalest part being a rocky pinnacle near its north-east elbow. A buoy, *chequered white* and *red*, and surmounted by a beacon, is moored about 60 yards eastward of this spot, in 4 fathoms, and marks the eastern edge of the shoal. A buoy, *chequered black* and *white*, W. by N.  $\frac{1}{2}$  N.,  $1\frac{1}{4}$  cable from the former, lies off the western edge of the shoal in 6 fathoms water.

**Turbot Bank**, with 19 feet water and chiefly composed of sand, is one-third of a mile within Harbour rock. A buoy, *striped white* and *red vertically*, and surmounted by a beacon, marks its eastern side in 5 fathoms water. W.N.W. from it, rather more than a cable distant, is a buoy *striped white* and *black vertically*, in 5 fathoms water, marking its western edge.

**Ram Point Bank** projects from the west shore of the entrance, between Weaver and Ram points. From it a spit, with 26 to 30 feet water over it, extends into the channel for a distance of more than 3 cables from the shore. The *red* buoy, No. 3, marking its extremity, is in 5 fathoms water, N.  $\frac{1}{2}$  E., 2 cables from the west buoy of Turbot bank, and must always be left to the westward by large ships. On the outer edge of the bank off Ram point, is another *red* buoy, No. 4, 'at  $1\frac{1}{2}$  cables

distance from the shore, in 5 fathoms water. It serves also to mark the entrance to Crosshaven (Carrigaline river).

The opposite shore under Carlisle fort is moderately bold, and the navigable channel between about  $2\frac{3}{4}$  cables wide.

**BUOYS.**—Within the harbour, the western banks are defined by *red* buoys, the eastern by *black* buoys, there are also a number of fairway buoys painted *white* and *black*. To the southward of Spike island the western bank is steep-to, with not more than 6 feet water 200 feet from the buoys, but from abreast the island northwards, a flat with from 19 to 22 feet water extends from the western bank; and the buoys, which are intended to mark the safe channel for large ships, are laid on its outer edge in 24 feet water, at the distance of nearly one quarter of a mile from the 2-fathoms edge of the bank. Two cables southward of Spit lighthouse is a small *red* buoy, moored close to the 18 feet limit of the bank, for the use of vessels of not more than 15 feet draught, which find good anchorage between it and the outer Spit *red* buoy, clear of the larger class of shipping.

The *black* buoys marking the eastern banks, are all moored in 24 feet water. The first of these, inwards, at 2 cables to the north-west of Dogsnose, is just to the westward of a small detached bank, with 17 feet water over it. Vessels of less than 12 feet draught may, if necessary, pass to the eastward of this buoy, taking care to keep Roche point lighthouse open of Dogsnose point; but this must not be attempted with the other buoys, as the bank is in places steep-to. The second *black* buoy is abreast Corkbeg, distant from it nearly half a mile. On the flat between them is a half-tide rock, called Black rock, marked by an iron perch, but quite out of the way of shipping. The fourth *black* buoy from Dogsnose marks the entrance of East channel.

The Fairway buoys, painted *white* and *black*, and extending from abreast Corkbeg to as far up as Passage, are for the purpose of denoting that part of the channel reserved for vessels under way. South and east of Spit lighthouse, the fair-way or channel course, is to the *east* of these buoys; between Spit lighthouse and Monkstown it is to the *north* of the fairway buoys, and to the south of the mooring buoys for men-of-war to the westward of Queenstown; and from Monkstown to Horse head it is to the *west* of the fairway buoys; and no vessel should anchor within the limits so reserved as a highway.\*

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\* By the bye-laws of the port of Cork, the word "Fairway" shall mean a space within the port, reserved as a highway for vessels, lighters, and boats in motion; and no vessel or lighter in any part south of Spit lighthouse shall be anchored between the lines of the black buoys and the fairway buoys; and excepting those lying at a quay, no vessel between Spit lighthouse and Monkstown shall anchor to the north of the line of fairway buoys; between Monkstown and Horsehead no vessel shall anchor to the west of the line of the fairway buoys.

**Bar Rock.**—Abreast Spit lighthouse, a flat called the Bar stretches across the harbour from the elbow of Spit sand to the eastern bank. The deepest water over it, 29 feet, is near the east side of the channel ; on its west side it has from 20 to 25 feet water, and it is, therefore, an obstruction to only the largest class of ships at low water. Bar rock, with 16 feet water, is a small rocky knoll on the north edge of this flat, and nearly in the fairway. A *cask* buoy with *black* and *white* rings, is moored close to the north end of the rock, with Spit lighthouse S.W.  $\frac{1}{4}$  W.  $2\frac{1}{2}$  cables distant. Large ships must always pass to the north-eastward of it.\*

**Spit Bank**, extending in an easterly direction from Haulbowline island towards Spit lighthouse, dries to a great extent at low water, and forms a shelter to the anchorage off Queenstown.

Its northern edge, marked by three *red* buoys, sweeps round from the lighthouse to Haulbowline island, and is steep-to ; as is also the opposite shore of Queenstown, to which it runs nearly parallel, preserving a distance of about 2 cables from it.

**Rock Shoal**, with 12 feet water, extends 200 yards E.S.E. from White point, and is marked by a *black* buoy with the word *Rock* painted on it.

**Crosshaven**, resorted to by coasters and other small vessels, is at the entrance of Carrigaline river, just within Ram point, where they find good shelter in from 8 to 13 feet water. The channel round the point is so very crooked that proper directions for its navigation cannot be given. It is, however, recommended to keep in the ripple of the tide, which is generally visible ; or to go in a little before high water, when a vessel that draws not more than 10 or 12 feet will pass over all the dangers that might otherwise obstruct her passage.

**West Channel**, leading from Ram point to the westward of Spike and Haulbowline islands, is very narrow and tortuous, with but 6 feet in it at low water. Some of the coasting steam-vessels occasionally avail themselves of it at high water spring tides ; but as it is not well defined by buoys and beacons, it can only be used by those possessing the requisite local knowledge. The stream of ebb makes down this channel three-quarters of an hour earlier than at Queenstown.

**East Channel**, the entrance to which is marked by the fourth *black* buoy from Dogsnose, leads from Man-of-war road to the channel between Great island and the main land, called East passage ; just above which the deep water terminates. It is available for ships drawing as much as 18 feet water, but not being defined by buoys or perches, the services of a pilot are indispensable for its navigation.

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\* Arrangements are being made for showing a sector of *white* light from Spit lighthouse, between the bearings S.W.  $\frac{1}{2}$  S. and S.W. by W.  $\frac{1}{2}$  W. to cover the rock.

**Anchorage.**—Vessels will find secure anchorage anywhere above Dogsnose, between the *red*, and *black*, buoys. Abreast Dogsnose they will have 15 fathoms water, 10 and 12 fathoms abreast Spike island, and 5 to 6 fathoms abreast Spit lighthouse.

The most convenient anchorage for large ships is to the eastward of Spike island in Man-of-war road. Ships of great draught should not go farther to the northward than to bring the Scotch church at Queenstown a little open to the north of Spit lighthouse, bearing N.W.  $\frac{3}{4}$  W., where they will have from  $4\frac{1}{2}$  to 6 fathoms at low water. Vessels of under 15 feet draught will find very convenient anchorage, as before stated, between the outer Spit buoy and the edge of the western bank, in 3 to 4 fathoms water, clear of the traffic of the port. Moor with open hawse to the south-west.

The inner anchorage called Queenstown road extends from opposite the east end of Queenstown to as far as Haulbowline island, throughout which there is good holding-ground in 8 to 10 fathoms water. Vessels may anchor in any part of this channel that is most convenient, except within the limits reserved as a highway (*see page 31.*) Men-of-war usually lie to the westward of Queenstown, between it and Haulbowline. The flag-ship and coast-guard ship have permanent moorings here, and vessels proceeding up to Haulbowline for supplies or repairs anchor above them, or secure to one of the mooring buoys placed here for their convenience. In taking up a berth here be careful to avoid Rock shoal off White point.

If, on arriving off the harbour with a northerly wind, it should be necessary to anchor on account of the ebb tide, or other causes, it would be advisable in so doing to keep the mouth of the harbour open. A convenient berth will be found with Roche point lighthouse bearing N.E.  $\frac{3}{4}$  E., and Templebreedy church N.N.W.  $\frac{3}{4}$  W., in 10 fathoms water, on muddy bottom.

**TIDES.**—At Queenstown, it is high water, full and change, at 5h. 1m.; springs rise  $11\frac{1}{4}$  feet, neaps 9 feet. The flood stream sets in the first instance into White bay, and thence obliquely across to Crosshaven, whence it is again warped into a north-easterly direction, which produces corresponding counter tides and eddies along both shores. The ebb stream has a directly opposite tendency. The average velocity of the streams does not exceed the rate of 2 knots, but about Turbot bank and Harbour rock, and also in the narrows off Monkstown, and in East passage, they often attain as much as 3 knots.

**Directions.**—To steam, or sailing, vessels of moderate draught having a leading wind, the entrance of Cork harbour presents no difficulties to navigation that may not easily be overcome with the assistance of the chart of the harbour, and a moderate degree of seamanship. Should, however,

## 34 OLD HEAD OF KINSALE TO GREAT NEWTOWN HEAD. [CHAP. II.]

the services of a pilot or steam tug be required, they may be readily obtained by hoisting the usual signals.

To vessels approaching the harbour from the westward, Daunt rock lies directly in the track, and must be carefully avoided. Coasters often pass within it, but no large vessel should attempt to do so, more particularly as no object would be gained by pursuing such a course, the saving in distance between Old Head and Roche point being inappreciable.

By day, the light-vessel and the buoy, will sufficiently indicate the position of the rock. Should they be adrift, as has sometimes happened with the buoy, the land must be given a berth of at least  $1\frac{1}{2}$  mile, until Roberts head bears N.W.  $\frac{1}{4}$  W.

By night, vessels from the westward bound to Cork, should steer about E.  $\frac{3}{4}$  N., and not haul up towards Roche point light until they have shut in the *fixed white* danger light, and have brought the *intermittent white* light to bear N.N.E.  $\frac{3}{4}$  E., when they may steer for it, taking care not to open the *fixed white* light again until well past the rock. When the Spit *red* light is in view a vessel will be to the eastward of the rock. After Daunt rock has been passed, the shore may be approached to a depth of 6 or 7 fathoms water.

In thick weather a vessel must feel her way in with much caution, as the bottom is rocky and irregular, and the soundings afford no certain guide. By keeping without the depth of 20 fathoms she will avoid all danger, and no ship should approach within that depth until her position has been ascertained. By careful attention, the gun which is fired at the light-vessel, or the fog bell at Roche point lighthouse, may be heard in time to warn a vessel of her proximity to these dangers.

Coming from the eastward a large ship should stand towards the shore with caution on account of Pollock rock off Poor head, and the foul ground off Roche tower. The former may be avoided by keeping Capel island open of Ballycottin island, E. by N.  $\frac{1}{8}$  N., until Geileen village appears open of Poor head, N.N.W.  $\frac{3}{4}$  W., or by not coming into less than 13 fathoms until Poor head bears North.

The coast-guard watch-house in Poor head bay, kept over the south-west end of Geileen village, E.  $\frac{1}{4}$  S., clears the foul ground southward of Roche tower.

Vessels of moderate draught may pass within Pollock rock, in 6 or 7 fathoms water, by keeping Roche tower in line with Poor head, N.W. by W., taking care not to come within half-a-mile of the latter to avoid Hawk and Quarry rocks. When eastward of Pollock rock a vessel may stand into 10 or 11 fathoms.

Ships entering the harbour with a leading wind generally prefer the channel eastward of Harbour rock and Turbot bank. When rounding

Roche point keep the whole of Haulbowline island, except the eastern store-houses, shut in behind Ram point, to avoid Cow and Calf rocks. The buoys marking Harbour rock and Turbot bank will be now distinctly seen, and in the absence of any good leading marks, are the best guides for avoiding those dangers. Should the buoys be gone, look out for some cottages immediately adjoining the west end of Cuskinney woods, which being kept just open of Dogsnose, N. by E.  $\frac{1}{4}$  E., will lead to the eastward of the shoals in the best water, until Camden fort bears N.W.  $\frac{1}{4}$  W. ; then steer North, or for the middle of Spike island, until well past Dogsnose, leaving the *black* buoy off it to the eastward, after which a N.E.  $\frac{3}{4}$  N. course will lead to the first fairway buoy, and right up to Man-of-war road.

A ship having the tide in her favour may work in or out at any time. From Ringabella bay to the northward for the distance of half a mile, the west shore is foul, and must be approached with caution, tacking in 6 fathoms. In working in, it is prudent to pass on the port tack through the sound between Harbour rock and Turbot bank ; but should the wind admit of it, there is nothing to prevent the endeavour to weather the latter, particularly as the flood tide in this part is always strongest. Care should be taken to tack at some distance from the eddy tide off the high land of Carlisle fort.

Beyond Carlisle fort no better directions can be given than to keep between the buoys marking the channel, and taking the utmost precaution to avoid getting into the eddies.

To proceed from Man-of-war road to Queenstown road, in a ship of more than 20 feet draught, it is better to have a pilot. A vessel may, however, at half-tide, with a fair wind and the channel pretty clear of shipping, run up to Haulbowline without any great difficulty, by keeping just to the eastward of the fairway buoys, rounding half a cable to the northward of the buoy on Bar rock, and then steering parallel to the Queenstown shore, at the distance of rather more than a cable from it.

**The RIVER LEE** is navigable for ships of the largest class for about  $2\frac{1}{2}$  miles above Haulbowline, to Passage west, a little above which the deep-water channel terminates, and is succeeded by the extensive shallows of lough Mahon. From abreast Horsehead, an average depth of 11 feet at low water spring tides has been obtained in the channel of the river up to near the city, when the depth increases to 20 feet ; the shoalest water in this track being  $9\frac{1}{2}$  feet near lough Mahon lighthouse.

Passage is connected with Cork by railway, and small steam-vessels run between them at all times of tide.

The city of Cork, originally founded on some marshy islands about 5 miles above Passage, has become a large and flourishing sea-port. The

## 36 OLD HEAD OF KINSALE TO GREAT NEWTOWN HEAD. [CHAP. II.]

river is now confined to two branches, on each of which quay walls have been built as far as their junction, where a handsome custom-house stands.

At Albert quay, on the south side of the river, are jetties with 20 feet depth at low water springs, where large ships discharge; there are also three jetties at Penrose quay, on the north side, at two of which ships of 20 feet draught can always lie afloat; the western jetty, which has 16 feet at low water, is principally used by the steam coasting trade. Ships of 500 to 700 tons discharge at the quays, where they have 7 to 8 feet at low water around them.

The harbour improvements began in 1761, but it is chiefly to the active use of the dredge that a vessel of 1,500 tons can now go up to and discharge afloat at the jetties; which formerly a ship of 140 tons could not do, without leaving half her cargo at Black rock.

The trade is extensive, chiefly in grain, provisions, and butter. The custom-house returns for 1875 were as follows:—Belonging to the port, steam vessels, 54=15,079 tons; sailing vessels, 229=25,481 tons. Arrivals, to discharge cargoes, coastwise, 2,394=512,378 tons; foreign, 381=178,587 tons. Sailings, coastwise, 1,423=405,352 tons; foreign, 134=56,234 tons. Besides the foregoing, 3,210 vessels =2,672,950 tons called for, and with, orders, mails, passengers, &c. Population in 1871, 78,382.

**LIGHTS.**—A pile lighthouse on the north-east side of the channel, opposite Meelough spit, 100 feet from the edge of the bank, marks the entrance of the channel to Cork through lough Mahon. It shows a *fixed red* light at an elevation of 24 feet. A bell is sounded in foggy weather. On the north side of the channel are two lights, that at Donkettle pile lighthouse is *green*, the other, at Tivoli, is *red*; and on the south side is a *white* light, in Black rock castle, and a *red* light at Dundain: these serve to mark the channel towards Cork by night. By day, it is well defined by beacons and buoys, the latter are coloured *black* on the star-board hand, and *red* on the port hand going up.

**TIDES.**—At Cork, it is high water, full and change, at 4h. 58m.; springs rise 12½ feet, neaps 10 feet.

There is a permanent tide gauge at Horsehead, graduated to represent the depth of water through lough Mahon.

**Directions from Queenstown to Passage.**—After Rock buoy, off White point, has been passed, a vessel should not approach nearer to the south side of Black point than one cable, nor to the west side of it than 2 cables, in order to avoid the mud flats. Shawnmore rocks, half a mile northward of Black point, extend upwards of three-quarters of a cable from the shore, and are marked by a *black cask* buoy. Steer to the westward from Rock buoy, until Ferry point at Passage opens; and then steer

northward along the west shore for the anchorage at Passage. The fairway buoys will also point out the channel course, which here is to the westward of them. Below Passage vessels may anchor where most convenient. Abreast the town of Passage the shores are flat to a short distance, mid-channel there are from 7 to 9 fathoms water. Laden vessels that cannot lie on the ground with safety must discharge here; and all vessels bound to Cork must wait here until they have sufficient water to carry them up. Ships of 20 feet draught can proceed up to the jetties at spring tides.

The navigation between Passage and Cork, being essentially pilot water, no directions for it have been given.

**The COAST** from Poor head to the eastward as far as Ballycottin island is high, and precipitous, but foul to some distance, and should not be approached into less than 10 or 12 fathoms water.

**Ballycroneen Bay**, 2 miles to the eastward of Poor head, is open, and affords no shelter. Nearly midway along the shore is the little village of Ballycroneen, and some coast-guard houses. A sandy beach extends to the westward from the village. Opposite the centre of the beach, and distant one-third of a mile from it, with the coast-guard houses bearing N.E., is a pinnacle rock with only 7 feet over it, and 3 to 4 fathoms at a cable's distance around it. The bottom throughout the bay is foul.

**The SMITHS**, a dangerous rocky shoal, W.  $\frac{3}{4}$  S. nearly  $1\frac{1}{2}$  miles distant from Ballycottin island, and half a mile from the nearest shore, consists of three distinct pinnacles disposed in the form of a triangle, about half a cable from each other. One of these uncovers on spring tides, at which time, the others have, respectively, 3 and 5 feet water over them. They rise from a small rocky base, carrying over it from 13 to 15 feet, and are steep-to to the southward.

A *black* conical buoy, with a staff and ball, is moored in 7 fathoms water on the south side of this danger.

**Wheat Rock**, dry on last quarter ebb, is a small patch between the Smiths and the shore, nearly half a mile N.W. of the former, with 4 to 5 fathoms between them.

Capel island and Knockadoon head, kept open of Ballycottin island, bearing E. by N.  $\frac{1}{4}$  N., will lead a little more than a cable southward of the Smiths, in  $6\frac{1}{2}$  and 7 fathoms water; it also leads southward of Pollock rock, off Poor head. Bishops tower (an old signal tower standing near the shore on the high land about midway between Poor head and Ballycottin island) bearing North, leads  $1\frac{1}{2}$  miles westward of the Smiths.

When standing in between Ballycottin island and Bishops tower, be careful to keep Capel island and Knockadoon head well open southward of Ballycottin island.



**BALLYCOTTIN BAY\*** affords good shelter in westerly and south-westerly gales. The soundings are regular, and shoal gradually from 10 and 9 fathoms abreast the lighthouse, to 3 fathoms at half a mile from the western shore. The bottom is good holding-ground, being sand over mud and clay; very little sea comes in between the islands, even at high water, when there is any westing in the wind. But with the wind from the eastward of south a heavy sea rolls in. The best anchorage is in from 7 to 4 fathoms, with the lighthouse bearing from S. by E. to S.S.W., distant half to three-quarters of a mile; and the coast-guard houses bearing from W.  $\frac{3}{4}$  S. to S.W. by S., where vessels are sheltered from the effects of the sea by the islands. Ballycottin island, 166 feet high and distinguished by its lighthouse, is the outer of two small islands that shelter Ballycottin bay to the southward, and is bold-to. The inner island, 54 feet high, is connected with the main land by a bed of rocks, which uncover on the last quarter ebb. The channel between the islands, one quarter of a mile wide, is obstructed by Sound rock, which shows its head between the seas at low water. There is a passage between the rock and the outer island, three-quarters of a cable in width, with 13 feet water. If compelled by any emergency to go between the islands, endeavour to pass eastward of Sound rock, and about three-quarters or half a cable from the outer island, which must be approached no nearer on account of the rocks that skirt its western side.

A pier harbour, dry at low water, at the extreme point of the main land, just within the western island, affords protection to fishing boats and small coasters; but it is subject to a heavy ground swell in southerly winds. Near to it are the coast-guard houses, which are conspicuous from the anchorage.

The northern shore of the bay is foul, with patches of 5 to 11 feet water extending half a mile off, until within  $2\frac{1}{2}$  miles of Capel island, when it becomes clear, and may be boldly approached to the depth of 6 or 7 fathoms within one quarter of a mile.

Standing towards this shore large vessels must tack in 10 fathoms, or not shut Ardmore head in with Capel island. The bottom between Ballycottin and Capel island, and for some distance seaward, is composed of rock, stone, and coarse hard ground.

The tidal stream is scarcely felt in the bay, but runs with some force round Ballycottin island, and through the sound.

**LIGHT.**—On the summit of Ballycottin island a circular white tower enclosed within white walls, exhibits, at an elevation of 195 feet above

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\* See plan of Ballycottin bay on Admiralty chart, Ireland, sheet XIII., Kinsale to Brattin head, No. 2,336.

high water, a *flashing white* light at intervals of *ten seconds*, visible from the bearing W.  $\frac{3}{4}$  S., round northerly, to E.  $\frac{1}{4}$  S. from a distance in clear weather of 18 miles. A bell is sounded in thick or foggy weather.

**Life-boat.**—A life-boat is stationed in Ballycottin bay.

**YOUGHAL BAY,\*** between Capel island and Ram head, which bear from each other E. by N. and W. by S.,  $6\frac{1}{2}$  miles distant, is much encumbered with dangers, and affords but little shelter. With off-shore winds and in moderate weather vessels may anchor to wait for tide on its west side, with the tower on Capel island bearing between W. by S.  $\frac{1}{4}$  S. and S.W.  $\frac{3}{4}$  S., from 2 to 5 cables distant, in from 6 to 8 fathoms water, sand and mud. With northerly winds vessels may bring up off Whiting bay, half a mile off shore, in 5 or 6 fathoms, sandy bottom; but with the wind anywhere on shore, or in unsettled weather, it is more advisable to keep under way.

**Capel Island** is rocky, precipitous, and bold-to; on its summit, 123 feet high, is the base of an unfinished light-tower. A sound, with from 13 to 17 feet water, separates it from Knockadoon head, on which is an old tower. Rocky ledges from both shores of the sound contract the channel to little more than a cable, and the tide runs through with great force, occasioning overfalls, which give it an appearance of danger. It is, however, sometimes used by coasters.

The north-western shore of the bay is flat and shelving. To protect it from the inroads of the sea, a series of groins have been erected, which form a conspicuous feature from the offing. The north shore is of moderate elevation and free from danger, terminating to the eastward in Ram head, also distinguished by an old telegraph tower. Half a cable S.E. of the head is a rock with 5 feet water, and steep-to.

The general character of the bottom throughout the bay is foul and rocky; but along the north shore there is a tract of sandy ground, extending from half to one and half miles off.

**Bar Rocks**, on the outer edge of the bar, with but 3 feet over them at low water, consist of three irregular patches extending 4 cables in length, and a cable in breadth, the centre patch, also the smallest, is  $2\frac{1}{4}$  miles N.E. from Capel island, and  $1\frac{1}{2}$  miles S. by W. from Youghal lighthouse. A buoy is moored in about 28 feet at low water, to mark the southern extremity of Bar rocks.

**Black Ball Ledge**, half a mile East of Bar rocks, has 9 to 12 feet over it, and is chiefly dangerous to vessels reaching in at low water, when waiting for tide to cross the bar. A *red* can buoy lies in  $3\frac{1}{2}$  fathoms 3 cables southeastward of the ledge.

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\* See Admiralty plan of Youghal harbour, with views, No. 2,071; scale,  $m = 4\cdot0$  inches.

#### 40 OLD HEAD OF KINSALE TO GREAT NEWTOWN HEAD. [CHAP. II.]

A distant rounded hill in one with Clonard hill, N.W.  $\frac{1}{4}$  W. (view C., chart 2,071), leads south-west of Bar rocks; and a distant white house, between two large houses in Whiting bay, N.E. by E.  $\frac{1}{4}$  E. (view D., chart 2,071), leads south-east of Bar rocks, and Blackball ledge.

**Black Rocks**, one and half miles to the north of Capel island, on the outer edge of the extensive strand that covers the west shore, uncover at  $3\frac{1}{2}$  hours ebb, and are out of the track of vessels going into Youghal harbour; but demand attention from their having caused the destruction of vessels obliged to run on shore in their vicinity. If, in the endeavour to save the lives of the crew, this alternative should be resolved on, the flat strand between Black rocks and Knockadoon head, offers the best chance of success. Run in for the sandy beach, keeping within 2 or 3 cables of Knockadoon shore, and leaving Black rocks on the starboard hand.

**Sound Rock**, with 9 feet water, is 4 cables north of Capel island, and between the latter and Black rocks. In the same line of direction, are patches of 17 and 9 feet, the latter one-third of a mile distant from Black rocks. The western shore then continues shallow with a foul rocky bottom up to the bar.

**The Bar**, composed of sand, with but from 2 to 5 feet water over it, sweeps round the entrance of the harbour between East point and Clay Castle, in the form of a horse-shoe, its southern elbow resting against Bar rocks.

There are two channels over it in use, known as East and West Bars, the former running close along by the north-east shore, with 5 feet at low water, is considered the best channel, as it maintains a depth of 6 inches more water than West bar. The water too is generally smoother, and there is no tidal stream in it. West bar channel is at the southern bend of the bar, facing the harbour, and has about  $4\frac{1}{2}$  feet depth at low water.

**Life-boat.**—A life-boat is stationed in Youghal bay.

**YOUGHAL HARBOUR**, formed by the estuary of the river Blackwater, is of small extent, but well sheltered, and affords sufficient accommodation for a number of small vessels.

The town, of considerable antiquity, stands on the declivity of the hills, on the west side of the harbour; vestiges of ancient walls still remain, but its chief object of interest is Sir Walter Raleigh's residence, now called Myrtle Grove. The markets are well supplied and stores are plentiful, but the only fresh water to be procured is from wells in the town. Repairs to a limited extent may be effected here. A railway connects Youghal with Queenstown and Cork.

Youghal is a creek of Cork. The exports are chiefly grain, cattle, and pit-wood. In 1873 the arrivals were 297 vessels of 25,295 tons. The salmon fishery is very extensive. Population, in 1871, 6,514.

The eastern shore of the harbour is encumbered by a flat called Dutchman's ballast, extending from the eastern point of entrance to Ferry point, a short mile within, where the harbour channel is further contracted to about one cable in width by a bank of hard ground projecting from the town side.

The large space between Ferry point and the wooden bridge to the northward of it is occupied by extensive mud banks, through which the Black-water maintains a channel with from 8 to 17 feet water. But this part is not easily accessible without the assistance of a pilot.

The best anchorage is abreast the custom-house in 5 fathoms, or with the court-house bearing West, in  $4\frac{1}{2}$  fathoms, and about half a cable from the west shore; moor directly. The bottom is everywhere hard, and covered with mussels. Gales from S.S.W. send in a good deal of swell at high water, compelling vessels to haul off from alongside the quays.

**LIGHTS.**—On the west side of the entrance to Youghal harbour a *fixed white* light is exhibited from a circular stone tower at an elevation of 78 feet, visible up the harbour, and round seaward to the bearing N.E. by N., at a distance of 6 miles.

A *red* light is exhibited from a window of the light-tower, between the bearings N.E. by N. and N. by E.  $\frac{1}{2}$  E., from two hours before till one and half hours after high water. A ball is hoisted during the same period of tide by day.

A *red* light is also shown from a window in a small building at the east side of the tower, between the bearings N.N.W.  $\frac{1}{4}$  W. and N.W., from two hours before till one and half hours after high water, to guide vessels through the east channel.

**TIDES.**—In Youghal harbour, it is high water, full and change, at 5h. 14m.; springs rise  $12\frac{3}{4}$  feet, neaps 10 feet.

In the entrance the stream runs with great force, but, half a mile to the southward of Cabin point it is scarcely perceptible until the ebb tide makes out of the harbour, when it draws to the south-eastward, at the rate of half a knot an hour, for four hours.

Half a mile to the southward of West bar, in the fairway, the stream during the first half of the ebb runs South, at the rate of half a knot, and the second half S.S.W.,  $1\frac{1}{2}$  knots, when it slacks. The stream for the first half of the flood veers from S.W. to West, and completes the revolution to N.W. and N.E. on the second half of the tide, but it never attains a greater velocity than half a knot.

**Directions.**—By day the entrance is easily recognised in the opening that separates its high bluff shores. Vessels arriving off Youghal and wishing to enter the harbour must be guided as to the time for doing so by the state of the tide and their draught of water; but they should always

## 42 OLD HEAD OF KINSALE TO GREAT NEWTOWN HEAD. [CHAP. II.]

endeavour to cross the bar before the last hour of the flood to insure tide enough to carry them up to the anchorage off the town. At high water springs there will be from 17 to 18 feet water on the bar, and at neaps from 14 to 15 feet; but the height of the tide is materially affected by the state of the weather, northerly winds making low tides, and southerly winds having a contrary effect. Southerly winds send a heavy sea into the bay, for which allowance must be made by vessels taking the bar.

Vessels from the westward, and intending to cross West bar, which channel they should always use with the wind from that quarter, may round Capel island at any convenient distance, then haul up about N. by E.  $\frac{1}{2}$  E. for Clay Castle (a clay cliff on the north-west shore) until the turret (an octagonal building at the inner end of Ferry point) is in line with the first hedge east of Bayview house, N.E. by N. (view B., chart 2,071). There is a roadway a little to the west of Bayview house, which will help to distinguish it. This mark will lead one-quarter mile westward of the *black* can buoy which lies to the south-west of Bar rocks, and over the bar in the best water,  $4\frac{1}{2}$  feet at low water. But the objects are not easily recognised by a stranger; and there are no other buoys, or beacons, to assist him.

Within the bar the depths gradually increase to 3 and 4 fathoms. When Ram head is shut in, haul up N. by E.  $\frac{3}{4}$  E. for the middle of the entrance, and on passing the lighthouse run in on the western shore, which is bold-to.

To cross East bar bring the spire of the Roman Catholic chapel at Youghal in line with East point, N.N.W. (view E., chart 2,071), and run in with this mark on, passing 3 cables eastward of the *red* can buoy to the south-east of Blackball ledge, until a farm-house on the hill at the back of the lighthouse comes in line with a painted mark on the sea wall, N.W.  $\frac{1}{4}$  W. (view F. chart 2,071), which will lead over the bar in the deepest water, 5 feet. As soon as the turret opens of East point the water will have deepened to 10 feet, and in a cable farther to 20 feet in the fairway of the harbour, a vessel may then steer along the western shore, keeping it at the distance of three-quarters of a cable, to avoid Dutchmans ballast. Do not go farther up the harbour than to bring the custom-house bearing West, to avoid the hard ground already noticed extending from Market quay.

Working in or out, while to the southward of Green Park embankment wall, a vessel may stand across the tail of Dutchmans ballast towards the east shore, by the lead, to within a cable of high-water mark. Northward of the embankment the working channel becomes very narrow, and Dutchmans ballast must be then approached with great caution.

To work out with southerly winds. As the tide will have fallen 6 inches by the shore before it makes out of the harbour, it is necessary to be

prompt in getting under way as soon as it slacks, in order to carry as much water as possible over the bar. By the time a vessel has worked down to the entrance, the stream will be setting out with great force directly for West bar. If the wind is light be careful that the strong ebb does not carry the vessel down on the shoal part of the bar. On East bar there will be no stream felt.

If on nearing the bar the water has fallen too much to admit of crossing it, bring up anywhere in the entrance, the nearer mid-channel the better, in from 3 to 4 fathoms, but do not go farther to the southward than to have Ram head just opening of Blackball head; if the wind freshens from the southward the shelter of the harbour can be easily regained from this position.

**RIVER BLACKWATER**, famed for the picturesque beauty of its banks, enters the sea at Youghal. Although possessing considerable natural advantages, it is little used for navigation. At the distance of one mile above the town of Youghal it is crossed by a wooden bridge, 1,875 feet long, and 10 feet above high water, with a drawbridge at the east end 40 feet wide, near which is the deepest water, 31 feet.

The Blackwater is navigable for vessels not exceeding 12 feet draught to as far as Strancally castle, 8 miles above the bridge, where they may lie afloat. As the tide in this part of the river maintains a rise of 13 feet on springs, vessels may, even in its present unimproved state, ascend above Camphire to Dromana (Lord Stewart's seat), where are some deep gullies, with from 10 to 12 feet water.

Above Dromana, in consequence of numerous salmon weirs and old stakes (the remains of weirs) arresting and accumulating the gravel washed down by the floods, it is difficult for a small boat to ascend the river at low water. At Cappoquin, 6 miles above Strancally castle, the river is spanned by a handsome stone bridge, and has a rise of tide of 8 feet on springs. Barges ascend the river to within a mile of Lismore, where the tidal flow ceases, and from thence to the town by canal, the further navigation of the river is impeded by extensive weirs.

**A Pilot** for the river may be procured at Youghal, whose services are indispensable to a stranger.

**The COAST**, eastward of Youghal bay, is high, bold, and precipitous, and free from outlying danger. Behind it, the sharp peak of Knockmealdown mountain, 2,609 feet high, and, to the eastward, the long ridge of Comeragh mountains, 2,597 feet high, are visible from all parts of the offing between Cork and Waterford.

**ARDMORE BAY**, to the north-east of Ardmore head, is open and exposed, but clear of danger, and shoals gradually to the shore. If neces-

#### 44 OLD HEAD OF KINSALE TO GREAT NEWTOWN HEAD. [CHAP. II.]

sary, a vessel may anchor here in fine weather in 8 fathoms water, on a bottom of rock and sand, with Ardmore head bearing S.W. by W.  $\frac{1}{4}$  W., half a mile distant, and the same distance from Black rocks, which form the north boundary of the bay, and uncover to the distance of 2 cables from the shore.

One of the ancient round towers stands on the slope of the hill a little above the village of Ardmore, and is a conspicuous object from the bay. The landing-place is among the rocks in the corner of the bay, near the village.

**Life-boat.**—A life-boat is stationed at Ardmore.

**MINE HEAD**, a bold precipitous headland, 222 feet high, and steep-to, may be known by its lighthouse. There are two outlying rocks in its vicinity. The westernmost, covered at high water, called the Longship, is one mile westward of the head, and 2 cables from the shore. Rogue rock, one-third of a mile eastward of the head, and quarter of a mile from the shore, is 9 feet above high water, and steep-to, seaward, but it is connected with the shore by a ridge of half-tide rocks.

**LIGHT.**—The lighthouse, a circular stone tower, stands near the brink of the cliff, and exhibits, at an elevation of 285 feet, an *intermittent white light, eclipsed for ten seconds every minute*, visible at the distance of 21 miles from E. by N.  $\frac{1}{8}$  N., round by north, to W.  $\frac{1}{8}$  S.

One mile north-eastward of the head a stream of good water discharges into the sea. The shore retains its bold elevated character to Helvick head, where it terminates in a precipice 230 feet high. Three miles westward of Helvick head, under Sea-view cottage, is a small sandy bay, where boats may land in moderate weather.

**DUNGARVAN BAY**, bounded on the south by the high bold promontory Helvick head, and to the north by Ballinacourty point and its outlying rocks, affords very good shelter in westerly gales; and in the Pool, at the entrance of the channel leading to the harbour, small vessels lie securely in all winds. Viewed at high water, the bay presents a large expanse; the greater part of it, however, uncovers, and the remainder is so shallow, and so much encumbered with dangers, as to be of little service to others than fishermen and coasters.\*

The Pool, with from 8 to 12 feet water, is the part of the channel leading to the harbour that is abreast Ballinacourty pier. Three *red* buoys lie upon the margin of the flat which bounds the Pool to the north, and there is one *black* buoy off Whiting bank. Three or four small vessels

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\* See Admiralty plan of Dungarvan harbour, with views, No. 2,017; scale,  $m = 4.5$  inches.

may lie here in safety, sheltered by Deadman sand, although with south-easterly winds, it is exposed to a good deal of sea at high water.

Fishery piers have been erected at Ballinacourty and Ballinagoul. There is also a little harbour at Helvick head, built by Lord Stewart de Decies, all of which dry between half and last quarter ebb.

**Dungarvan Harbour**, dry at low water, admits vessels of 11 feet draught alongside the quays. At the upper end of the quays near the bridge, are two holes with 17 and 19 feet water, which must be avoided by vessels taking the ground.

The town, chiefly supported by the fisheries, exports corn, flour, and prop wood, and imports coal and timber. In 1875, the returns for the port, which is a creek of Waterford, were as follows, viz.: Arrivals, coast-wise, 363 vessels = 25,625 tons; foreign, 4 = 664 tons. Sailings, coast-wise, 359 = 24,436 tons; foreign, 2 = 300 tons. Belonging to the port, sailing vessels, 36 = 2,607 tons. Population in 1871, 6,031.

**LIGHT.**—Ballinacourty point, the north point of the bay, is distinguished by a circular white light-tower which shows a *fixed* light at an elevation of 52 feet, visible 10 miles, between the bearings West and S.E.  $\frac{1}{2}$  S. Bearing between West and N.W. by W., it appears *green*. In the direction of Carrickapane rock it is *red*, and in all other directions *white*.

A reef, nearly all uncovered at low water, extends half a mile from Ballinacourty point in a south-easterly direction, terminating in Carricknamoan, a flat-topped rock elevated  $4\frac{1}{2}$  feet above high water; the direction of this reef is indicated by the sector of *green* light.

Four cables east of Carricknamoan is a rocky patch having a depth of 17 feet water. The lighthouse seen to the southward of Carricknamoan, leads southward of it; but this is not a danger to the class of vessels frequenting Dungarvan bay.

**Carrickapane**, a rock near the middle of the entrance of Dungarvan bay, is  $7\frac{1}{2}$  feet high, but of too small extent to afford any shelter to the anchorage. A rocky ledge, with 7 to 12 feet water over it, extends a long cable from it in a W.  $\frac{1}{2}$  N. direction; otherwise it is steep-to. Ballinacourty light throws a *red* ray over Carrickapane.

**Helvick Rock**, with 8 feet water, N. by E.  $4\frac{1}{2}$  cables from Helvick head, is marked by a *black* buoy, moored one cable eastward of the rock.

**The Gainers**, a rocky shoal, about half a mile to the north-west of Helvick rock, uncovers at low water, and is also marked by a *black* buoy,  $1\frac{1}{2}$  cables to the north-east of the elbow of the shoal. Both these buoys must be left to the westward when entering Dungarvan bay from the southward. Fishing vessels find shelter, in southerly gales, between Helvick



head and the Gainers. Westward of these rocks the bay is entirely occupied by sand-banks.

**Life-boat.**—A life-boat is stationed at Dungarvan.

**TIDES.**—It is high water, full and change, at Ballinacourty, at 5h. 12m.; springs rise  $12\frac{1}{2}$  ft., neaps  $9\frac{1}{2}$  ft. In the harbour it is high water at the same time. There is little stream of tide in the bay, excepting along the north shore and through the pool.

**Directions.**—Approaching Dungarvan bay, a vessel may stand in by the lead, as the soundings decrease gradually over a bottom of fine sand and mud. Carrickapane may be passed on either side; but the channel to the north of it is the clearest. Vessels from the eastward run boldly in between Carricknamoan and Carrickapane, but they should on no account attempt to pass between Carricknamoan and the shore.

When Clonea castle opens to the westward of Carricknamoan, vessels may anchor in 3 to 5 fathoms water, on sand and mud, with Helvick head from S.  $\frac{1}{2}$  W. to S.  $\frac{1}{4}$  E., the lighthouse North to N.N.E., and Carricknamoan from N.E. to E.N.E.

From the southward steer N.N.E. past Helvick head, which is steep-to, until Knob hill is in line with Wyse point, N. by W.  $\frac{3}{4}$  W. (view A., chart 2,017). This will lead close to the eastward of the buoy marking Helvick rock and one cable east of the Gainers buoy, and will also clear the foul ground west of Carrickapane. When Clonea castle opens west of Carricknamoan, steer to the northward and anchor as before directed.

South-west gales send a heavy swell into the bay. Should the wind draw to the southward of S.W., a vessel may weigh her anchor and run into the pool for better shelter. For this purpose bring the Glebe house in line with a rounded dark-coloured hill, N.W. by N. (view B. chart 2,017). The high peak of Knockmealdown will appear a little to the right of this line. This mark will lead west of the *black* buoy off Ballinacourty point, and east of two *black* buoys on the west side of the channel, but rather too near the inner of these buoys, which is on the tail of Whitehouse spit, abreast Wyse point; the Glebe house should, therefore, be kept on with the left side of the hill, until Ballinacourty house appears in line with the boat-house near the shore, when the Glebe house may be brought under the middle of the hill, which will lead into the pool, nearly in mid-channel. At the entrance of the channel near the outer *black* buoy there will be found 9 and 10 feet water, having passed the line of the boat-house, it deepens to 14 or 15 feet, the bottom gravel and stones. There is a flag-staff on Wyse point, and a little to the eastward of it a fishery pier. When the first thatched house near the inner end of the pier begins to open of Wyse point, anchor with the leading mark on, in 10 or 11 feet water, the bottom sand and clay. Moor with a kedge towards the pier. The channel

leading to the pool is barely half a cable wide, it therefore requires a leading wind. In proceeding up to the harbour a pilot is indispensable. To work out of the bay, weigh with the first of the ebb, and go out northward of Carrickapane, assisted by the ebb stream from the harbour, which joins the channel stream outside running to the eastward.

**Caution.**—Vessels standing towards Dungarvan bay at night, must be on the look-out for the numerous hookers, which in moderate weather are always to be met with riding at anchor as much as 3 or 4 miles off shore.

**The COAST** between Dungarvan bay and Great Newtown head, a distance of 15 miles, is for the greater part bounded by precipitous cliffs, and fringed by detached masses of rock, but it is clear of outlying danger.

Ballyvoyle head, 243 feet high, and distinguished by a square tower, is  $2\frac{1}{2}$  miles eastward of Dungarvan bay. Clonca castle is at the head of the intervening bay.

At Bunmahon, situated about 5 miles eastward of Ballyvoyle head, are extensive copper mines, which yield annually about 7,000 tons of ore. Its engine-houses and tall chimneys are conspicuous from the offing. The cliffs are tinged with the ores, and perforated with old shafts. Bunmahon bay does not afford safe anchorage. Vessels trading here for the ores, lie in Dungarvan pool until the weather is favourable for their shipment.

**Burke and Sheep Islands** are clusters of bold rocky islets, lying from  $1\frac{1}{4}$  miles to  $2\frac{1}{4}$  miles westward of Great Newtown head, and extending half a mile from the shore. They are clear of outlying danger.

**Tidal Streams.**—Near Mine head the stream runs to the eastward for about one and half hour after high water by the shore. It is then slack for  $1\frac{1}{2}$  hours. Three hours after high water it commences running to the westward. The western stream runs half an hour longer than the eastern, or until  $3\frac{1}{2}$  hours after low water, when it is slack for three-quarters of an hour, and then turns to the eastward. The stream is strongest about one hour before high and low water, when it runs  $1\frac{1}{2}$  knots per hour. Near Burke islands it turns to the eastward  $1\frac{1}{2}$  hours before high water on the shore.

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## CHAPTER III.

## SOUTH COAST OF IRELAND, GREAT NEWTOWN HEAD TO CARNSORE POINT.

## VARIATION IN 1877.

Waterford - - 22° 45' W., decreasing 9 minutes annually.

**GREAT NEWTOWN HEAD**, the western boundary of *Tramore* bay, is elevated 147 feet above the sea, and distinguished by three white towers, on one of which there is the colossal figure of a man with his left arm extended in the direction of Waterford harbour. There are two similar towers on *Brownstown* head, the eastern limit of the bay, all of which form excellent landmarks, and were erected for the purpose of enabling mariners to readily distinguish between *Tramore* bay and the entrance to Waterford harbour, a mistake that has been fatal to a great many vessels.\*

The east and west shores of *Tramore* bay are high and bold, but the low sandy beach at its head, lying in front of the submerged lands of *Back strand*, gives it the appearance of an estuary, in hazy weather, and is the occasion of its being so frequently mistaken for the entrance to Waterford harbour.

The town of *Tramore*, on the north-west shore of the bay, is conspicuous from the offing. A railroad connects it with Waterford, 7 miles distant. At *Ladies cove* near the town there is good landing in moderate weather. The eastern side of the bay is encumbered with sands and outlying rocks.

On a line between the points of the bay, there are from 9 to 10 fathoms water, but its exposed position and indraught of the tides renders it at all times unsafe to approach.

To a vessel hopelessly embayed, the best chance of saving life, and probably cargo, is offered by running on the beach in the north-western corner of the bay, within a mile of *Tramore*, where it is all clean sand. Vessels driven on the east side of the bay take the ground at too great a distance to receive assistance from the shore, and are speedily involved in destructive breakers.

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\* See Admiralty chart, Ireland, sheet XIV., Brattin head to Wexford, No. 2,049; scale,  $m = 0.5$  inch.

**TIDES.**—It is high water, full and change, in Tramore bay, at 5h. 40m.; springs rise 13 feet.  $1\frac{1}{2}$  miles without the points of the bay, the stream makes to the eastward  $1\frac{1}{2}$  hours before it is high water on the shore. The streams are weak on the western side of the bay; on the eastern shore they are influenced by the ebb and flow of the Back strand. Southerly and south-west gales cause a great set into the bay.

**Life-boat.**—A Life-boat is stationed in Tramore bay.

**The COAST.**—Between Brownstown head and the entrance of Waterford harbour is bold-to and clear of danger, with the exception of Swede patch, three-quarters of a mile eastward of the head, and  $1\frac{1}{2}$  cables from the shore; and Falskirt half-tide rock, off Swine point, 2 cables from the shore.

**WATERFORD HARBOUR.**—From its position at the south-eastern angle of Ireland and near the entrance of St. George channel, is invaluable to seamen as a harbour of refuge. The entrance between Swine point and Hook point, bearing from each other S.E. by E.  $\frac{1}{4}$  E. and N.W. by W.  $\frac{1}{4}$  W., is 4 miles wide and free from danger; and the harbour offers a large and a well sheltered anchorage, but a flat having only 13 feet over it obstructs the entrance at low water. Impressed with its great natural advantages, the Royal Commissioners on harbours of refuge, in 1859, recommended that a public grant should be made for the purpose of deepening the approach by forming a channel 200 yards wide, and not less than 21 feet in depth at low water spring tides, but this has not yet been carried out.\*

Commercially, the harbour derives additional importance from its being the estuary of two navigable rivers, the Suir and Barrow, on the banks of which are the towns of Waterford and New Ross, connected by canal and railway with all parts of the interior.

The western shore of the entrance is high and bold, and dotted with numerous cabins. Hook point, or eastern shore, is a long and narrow promontory of limestone, of a low level appearance terminating in a shelving point on which stands the lighthouse. If the weather is clear, vessels from the southward will make the interior mountains before the land bordering the coast is seen. Of these Comeragh mountains, or high lands of Dungarvan, 2,597 feet high, are the most conspicuous, and eastward of these and more distant is Slievenaman, 2,362 feet high. The remarkable peak of Tory hill, and the flat-topped Slieve Coiltia, enter into every view of Waterford; the latter is on the meridian of the Hook. Farther to the eastward the rugged hill of Carrickburn, in the county Wexford and Forth mountain will be seen; while South Saltee island will

\* See Admiralty plan of Waterford harbour, No. 2,046; scale,  $m = 3.0$  inches. Also plan on chart of Irish channel, sheet 2, No. 1,825b.

appear in the eastern horizon. As the land is approached the high shores of county Waterford, terminating to the eastward in Credan head, will sufficiently indicate the entrance to the harbour until Hook lighthouse and Loftus hall appear above the horizon.

*Passage*,  $7\frac{1}{2}$  miles above Hook point, where the irregular shores of the entrance first approach each other, is the usual anchorage for vessels seeking refuge or waiting tide to go up to the city of Waterford, 6 miles distant, by land, whence supplies of all kinds may be procured. Fresh water is to be obtained at a stream in a little bay, one mile to the northward of Duncannon fort.

**LIGHTS.**—**Hook Lighthouse**, near the extreme point of the Hook, is a circular tower 115 feet high, painted white, with three horizontal red belts, and exhibits a *fixed white* light, at an elevation of 152 feet, visible in clear weather at the distance of 16 miles. During foggy weather a gun is fired *every ten minutes*. The tower, of considerable antiquity, has extremely thick walls, and in 1791 was raised to its present height and converted into a lighthouse.

**Dunmore Lighthouse**, at the head of the pier, exhibits, at an elevation of 44 feet, a *fixed* light; *red* to seaward, and *white* to the northward of the pier; but it can rarely be seen more than 4 or 5 miles to seaward.

**Duncannon Lights.**—The low lighthouse, in the south-west angle of the fort, exhibits two *fixed white* lights, vertical, 10 feet apart. The upper light, at an elevation of 53 feet, is visible 10 miles to seaward, and shows also in the direction of Passage. The lower light, seen only from seaward, was evidently intended for a tide light, but is now kept burning throughout the night.

The high lighthouse, on the high land north of Duncannon fort, N.N.E.  $\frac{1}{4}$  E.,  $5\frac{1}{2}$  cables distant from the low lighthouse, shows a *fixed white* light, at an elevation of 128 feet, visible 16 miles. The lights in line leads over the bar.

Duncannon fort commands the entrance to the harbour, and the deep water channel runs close to it.

**Pilots.**—Waterford pilot boats, distinguished by a red and white flag, and by the word "PILOT" on their sails, are met with off the entrance to the harbour. The rates are moderate, and the pilots skilful in the river navigation.

Vessels bound to Waterford exchange pilots at Passage.

Steam tugs may be procured at Duncannon or New Ross.

**Life-boat.**—A Life-boat is stationed at Duncannon.

**Dunmore Harbour**, on the west side of the entrance, built for the accommodation of the Post Office packets which formerly ran to Milford, comprises an area of 6 acres, enclosed by a pier extending 700 feet in a north-easterly direction, on the head of which is the lighthouse.

Formerly there was as much as 20 feet water in the entrance, with 16 and 18 feet inside; there is now (1876) but 14 feet in the entrance gradually decreasing to 8 feet within the pier, the deepest water being at the east side. With south-east gales there is a good deal of swell in the harbour at high water, which decreases as the tide falls, additional shelter being then afforded by the stones washed from the back of the pier, to which a good berth must be given when rounding the pier head.

Although abandoned as a packet station, Dunmore is most useful as a fishery harbour, and is the rendezvous of vessels from Dublin and other ports, when engaged in trawling on the south coast.

**Dunmore Bay** affords temporary anchorage with northerly winds, in  $3\frac{1}{2}$  fathoms water, muddy bottom, with the lighthouse bearing S.W. by S. one to two cables distant, and about a cable off shore. Vessels should not risk being caught here with a south-east wind, but be prepared to leave on the first appearance of a change. Off the north point of the bay, Laweesh rock, at half a cable from the shore, uncovers at half ebb.

On the hills northward of Dunmore the village of Killea, with its Roman Catholic (white) chapel and ruined tower, is conspicuous from the sea.

**BRECAUN BRIDGE**, on the south-eastern coast of the Hook, 2 miles E. by N.  $\frac{1}{2}$  N. from the lighthouse, is a dangerous reef extending upwards of 3 cables from the shore, with only 4 feet water on its outer edge, and 5 fathoms at  $1\frac{1}{2}$  cables distance from it. To clear it keep Forth mountain open of Baginbun point, bearing E. by N.  $\frac{3}{4}$  N.; or Hook lighthouse open of Slade point, bearing West; or tack in 9 fathoms. Between the reef and Hook point the shore may be boldly approached to the distance of a cable from the rocks.

A rocky ledge extends from the extreme point of the Hook 2 cables in a W.  $\frac{3}{4}$  S. direction, with 18 feet on its outer edge, deepening suddenly to 30 feet, and occasioning heavy overfalls, which in stormy weather become dangerous to small vessels.

The soundings decrease gradually from 8 or 9 fathoms, between Hook point and Red head, to 4 fathoms at a mile south of Credan head, over a bottom of sand and mud. Half a mile S.W.  $\frac{3}{4}$  S. of Credan head is a bank of 19 feet water; and abreast the head, which is steep-to, is a hole with  $5\frac{1}{2}$  fathoms, whence the channel shoals gradually towards the bar.

**The Bar** is an extensive tract of sand and gravel, between Credan head and Duncannon fort, about a mile across, and with a depth of 13 feet water in the line of the leading lights. After a prevalence of northerly winds, accompanied by dry weather, there is a foot less water, or 12 feet only on the bar at low-water springs. Southerly winds have a contrary

effect. The soundings towards each shore decrease gradually until the bar buoys are approached. The east buoy, *black*, in 15 feet water, is placed three-quarters of a cable to the south-west of a spit of hard gravel extending from the east shore, with but 8 feet water on it, and, in conjunction with the *black* buoy on Duncannon spit, denotes the eastern limit of the navigation. The Middle buoy, *striped red and black*, is in  $9\frac{1}{2}$  feet water, on a detached bank of gravel. Between this bank and the western bank is a narrow channel with 14 feet water, near the middle of which a *red* buoy is placed. But the principal and most direct channel is between the east and middle buoys, for which Duncannon lights in line, N.N.E.  $\frac{1}{4}$  E., is the leading mark. Southerly gales have a great effect on the bar, covering its surface with large stones, which disappear after a short period of fine weather.

**Duncannon Spit** dries to a distance of two-thirds of a mile south of Duncannon point. Its western edge is steep-to, and is well defined by a salmon weir carried out to low-water mark, and by a *black* buoy in 12 feet water at its south end, nearly a cable to the westward of the low-water margin, with Duncannon low lighthouse bearing N. by E. distant six-tenths of a mile.

Duncannon point is steep-to, but the bight between it and the high lighthouse is filled by a mud flat. In the corner of the bight, immediately to the north-east of the fort, is a small pier harbour, and another at Arthurs-town,  $1\frac{1}{2}$  mile farther up, within which small vessels lie aground. Above Duncannon the deep channel is confined to the east shore by Drumroe bank.

**Drumroe Bank** is marked by three *red* buoys lying on its margin in 12 feet water, and by a pile lighthouse about 3 cables below Passage. From the southernmost buoy Duncannon fort lighthouse bears S.E. by E.  $2\frac{1}{2}$  cables distant, but it must be borne in mind that the tail of the bank, with not more than 6 feet water on it, extends one cable southward of this buoy. From the lower buoy the second buoy bears N. by E.  $\frac{1}{2}$  E. 2 cables distant, and from the latter the third buoy bears North 4 cables distant. From the third buoy to the pile lighthouse is N.N.W.  $\frac{1}{2}$  W.  $6\frac{1}{4}$  cables.

**LIGHT.**—A pile lighthouse, showing a *fixed red* light, stands on the extremity of a spit of gravel at the north end of Drumroe bank, which is steep-to, with 30 feet water a few feet from its edge.

In the channel abreast Duncannon fort there are 7 and 8 fathoms water, increasing to 10 fathoms abreast the pile lighthouse. Between Passage and Ballyhack on the opposite shore there is not more than 5 fathoms water.

Above Ballyhack the eastern shore is skirted by a sandy flat, which runs off into Seedes bank. The western or Waterford shore is precipitous, rocky, and bold-to.

From Passage on a N.N.W.  $\frac{1}{2}$  W. and N.E.  $\frac{3}{4}$  N. course, it is  $2\frac{1}{2}$  miles to Cheek point, where the rivers Suir and Barrow meet.

**Seedes Bank**, of sand and mud, with from 7 to 11 feet water and steep-to, extends from the eastern shore to nearly two-thirds of the distance across the harbour, leaving a channel little more than  $1\frac{1}{2}$  cables wide between it and the western shore.

Arthurstown church, kept open of Ballyhack hill, S.E.  $\frac{1}{4}$  E., clears the bank on the south-west side in 3 fathoms water; East cottage, (the small white cottage near the north end of the embankment) in line with the high-water shore at Cheek point, bearing N.N.E.  $\frac{1}{2}$  E., clears it on the north-west side; and a large house among the trees north of Dunbrody abbey open, clears its north edge.

Northward of Buttermilk point the east shore is covered by mud flats, a large portion of which is now embanked. The ruin of Dunbrody abbey, reputed to be the noblest monument of antiquity in the country, is a conspicuous object from this part of the harbour.

**Carters Patch**, a mud bank, with 14 feet water, from 2 to 3 cables N.N.E. of Buttermilk point, joins the eastern shore.

**Anchorage**.—Vessels may anchor anywhere in the channel between Duncannon and Passage. The best anchorage is off Passage, where they may bring up in any convenient berth, abreast or above the town, in from 3 to 8 fathoms water, good holding-ground, and well sheltered from all winds and sea. The former depth is on the Ballyhack shore, where the strength of the tide is less felt; vessels anchoring on this shore must take care to keep Arthurstown church open of Ballyhack hill in order to clear Seedes bank. On this line, with Ballyhack pier from half a cable to three-quarters of a mile distant, they will not have less than 3 fathoms water along the south-west side of the bank. Large vessels may anchor in mid-channel in from  $4\frac{1}{2}$  to 8 fathoms. The west shore above Passage is steep-to, and the ebb tide sets strongly past it.

There is very good anchorage in the bight northward of Buttermilk point in from  $2\frac{1}{4}$  to 5 fathoms water. The former depth is on Carters patch, but the best berth is to the north-east of it, in 3 to  $3\frac{1}{4}$  fathoms, with Kilmokea point (the east point of entrance to the Barrow) touching Cheek point; and a remarkable white house with a few trees around it, standing on the high shore to the north-west of Passage, shutting in with Buttermilk point, bearing S.S.W.  $\frac{3}{4}$  W.

The holding-ground of this anchorage, soft mud, is not so good as that at Passage.

**TIDES**.—It is high water, full and change, at Dunmore, at 5h. 27m.; springs rise  $12\frac{1}{4}$  feet, neaps  $9\frac{1}{4}$  feet. At Duncannon fort, it is high water, full and change, at 5h. 20m.; springs rise  $12\frac{1}{2}$  feet, neaps 10 feet.



A tide-rip, extending across the entrance of the harbour from the Hook to Swine point, marks the junction of the harbour with the channel stream. During the first four hours of its course the ebb tide setting out of the harbour in a south-westerly direction, and meeting the channel stream setting to the eastward, occasions this ripple.

Half a mile south-west of Hook point, the first four hours of the flood stream sets W.N.W. two knots an hour; near the shore on the west side of the Hook the flood stream is scarcely perceptible during this period.

Midway between the Hook and Dunmore the stream does not set into the harbour until half-flood by the shore, but close along the western shore the first of the flood drains towards the harbour.

In the entrance, within or northward of this line, the stream follows the direction of the shore. The ebb stream continues from half an hour to one hour longer than the flood.

The ebb stream from Cheek point sweeps round St. Catherine bay, and is deflected by Buttermilk point across the channel to the opposite shore. Vessels dropping down in a calm, or light wind, must keep their heads to the eastward, or from a position a little above Buttermilk point they will be carried upon the rocks on the western shore.

Off the pitch of Buttermilk point the stream has scoured a deep hole with 9 fathoms water close home to the rocks.

**Directions.**—Approaching from the westward beware of the fatal error of mistaking Tramore bay for the entrance to Waterford. Off Tramore bay the water is deeper than at a similar distance from the entrance to Waterford: 2 miles south of Great Newtown head there are 16 and 17 fathoms, gravel and stones; and at the same distance south of Redhead there is 14 fathoms, sand and stones; but there is nothing sufficiently distinctive in the character of the bottom to enable a vessel by sounding to ascertain her true position. By not coming into less than 17 fathoms water, she will, however, keep well without the heads of the bay.

Having passed Tramore bay, the shore may be approached to the depth of 10 fathoms. Sheep island kept open of Brownstown head, N.W. by W.  $\frac{1}{2}$  W., until Broomhill point shows open of Redhead, clears Falskirt rock. As the first of the flood makes into the harbour earlier close along this shore than farther out, small vessels may take advantage of it to make short tacks along the land.

From the eastward the course from Saltees light-vessel to the entrance of the harbour is N.W.  $\frac{1}{2}$  N.  $11\frac{1}{2}$  miles. Working up, between Baginbun head and the Hook, be careful to avoid Brecaun bridge. If the eastern stream is running, which it continues to do until 4 hours after high water

by the shore, make short tacks along the land, where there is an eddy as far as Hook point.

With north-west winds a vessel may stop a tide off the village of Slade, in 5 to 7 fathoms, rocky bottom, with Slade castle bearing W. by N.  $\frac{3}{4}$  N., half a mile off shore. Rounding the Hook in stormy weather give it a good berth to avoid the race off it.

In fine weather a vessel may bring up anywhere in the entrance of the harbour to wait for tide. Large ships arriving off the port with southerly winds should keep well outside the heads. Some by coming too close in have been carried up by the tide before they had sufficient water, and have suffered injury by striking on the bar, where is always a swell with these winds.

To cross the bar with a leading wind, having arrived off Credan head, proceed with Duncannon lights in line, N.N.E.  $\frac{1}{4}$  E. By day, bring the lower lighthouse on with the west corner of the upper lighthouse wall (the summit of Slieve Coiltia will be seen in the same line), which leads in 14 feet at low water, or a foot more than with the lights in line. Leaving the *black* buoys on the starboard hand, and the *red* and *black striped* buoy on the port hand, as Duncannon spit buoy is approached, steer N. by E.  $\frac{1}{2}$  E., gradually opening the high light to the westward of the low light, and passing Duncannon fort at a cable's distance; run along the eastern shore to above Passage, being careful to leave all the *red* buoys on Drumroe bank on the port hand. After Duncannon spit buoy has been passed the water deepens to 6 and 10 fathoms.

With a working wind, after Falskirt rock, off Swine point, has been passed, the west side of the entrance, which is the best to work in on, may be boldly approached to within a cable of the shore to as far up as Credan head. Standing to the eastward, Hook point, being moderately bold, may be approached to within 3 cables, until to the northward of Loftus hall, where the lead must be the guide, as the flat then extends a long way off.

In working over the bar, while to the southward of the buoys, tack in any convenient depth, pass between the *black* east buoy and the *red* and *black striped* middle buoy. When the latter can be weathered a cable's distance, the west shore may be again approached by the lead; standing to the eastward, bear in mind that three-quarters of a cable north-east of the *black* buoy there is a ridge of hard ground with 8 feet over it, and that from thence towards Duncannon the eastern bank is steep-to.

Opposite Duncannon fort be very careful to avoid the tail of Drumroe bank, which extends nearly one cable southward of the lowest of the *red* buoys marking the bank; the south martello tower over Duncannon open southward of the fort, or the south face of the fort open, clears it. Arthurs-town pier kept in line with a remarkable rock to the left of a roadway on

the north side of Kings bay, bearing North, until the west side of the flat-topped hill over Cheek point comes in line with the low cliff on the eastern shore to the northward of Ballyhack, bearing N.N.W.  $\frac{1}{4}$  W., and then the latter mark, leads eastward of the bank, and up to the anchorage off Passage.

In the bight above Duncannon, tack the first shoal cast, and stand towards Arthurstown pier with caution. With these exceptions the east shore above Duncannon may be boldly approached.

Above Passage, proceed along the western shore at the distance of from half to one cable from the rocks, keeping Arthurstown church open of Ballyhack hill until East cottage comes in line with Cheek point, in order to clear Seedes bank.

**RIVER SUIR** is navigable by vessels of 20 feet draught to as far as the city of Waterford, where they may lie afloat in front of the quays; and for several miles beyond this it may be navigated by vessels of considerable burthen.

**Cheek Point Bar**, with from 9 to 11 feet water, stretches across the entrance of the Suir. The best water over it, 11 feet, is with the flour mill (a large white building near the water west of Snowhill house) in line with the high-water boundary under the house, bearing W.  $\frac{3}{4}$  N.

Drumdowney point is fronted by a mud flat which dries off some distance to the southward. The east shore of the entrance to the Barrow is similarly encumbered, leaving a narrow channel on its western shore, to be described hereafter.

Proceeding up the Suir, after Cheek point bar has been crossed, the water soon deepens to 10 fathoms in mid-channel. The river winds round in a south-westerly direction, through Glasshouse reach, for rather over 2 miles, to Little island. The northern or Kilkenny shore is bold-to, but the south shore is skirted by a mud flat, with occasional patches of rock.

The **Bingledies**, one of these patches, opposite Glasshouse, dries to half a cable from the south shore, and is marked by a *red* buoy. Bolton rocks, also on the south shore, are 4 cables to the south-west of the Bingledies. A *red* buoy is placed  $1\frac{1}{2}$  cables N.N.E. of them, and distant from the low-water margin about half a cable. Both these buoys must be left to the south-eastward or on the port hand going up. One cable south-west of Bolton rocks, is a bank of mud, which uncovers to a cable from the shore.

At Little island the river channel divides; the old channel, or natural bed of the river, called King channel, encircling the island southward, is very tortuous, and  $2\frac{1}{2}$  miles long. Queen channel, on the north side of the island, which is direct, and scarcely one mile long, has been dredged to a depth of 13 feet at low-water springs.

**King Channel**, has a bar of 13 feet water at its east entrance. Approaching it from the eastward, two buoys will be observed on the starboard hand, one *black* and another *red*; these mark the entrance to Queen channel. Farther to the southward another *black* buoy will be seen on the shoal ground that extends from the east end of the island, and which stretching across to the main, forms the bar, the deepest water over it running along the shore of the main.

Proceeding through King channel the bluff point on the port hand may be grazed by a ship's side; abreast it there are 12 and 13 fathoms in mid-channel.

The south end of the island is foul, but there is a clear channel along the south side of the bight, close to the edge of the mud, with good anchorage in from 3 to 10 fathoms water. Proceeding to the northward, where the channel again contracts, a *red* buoy will be seen 50 yards from the west shore, marking the position of Maulus rock, a pinnacle nearly dry at low water. The channel between it and the island is only 100 yards wide, with 18 fathoms water.

Leaving Maulus rock on the port hand, we next come to Golden rock, a ledge on the island side, which dries off to a distance of 117 yards from the shore. A *black* buoy is laid on its outer edge, which must be left on the starboard hand.

The next danger is Dirty tail, bordering the point on the western shore, and extending half-way across the channel. Its outer edge is marked by a *red* buoy, which must be left on the port hand. Rounding it, and hauling up westward, we re-enter the main channel of the river.

Six-foot patch is a bank of mud near the middle of the river, where King and Queen channels unite.

To facilitate the passage of sailing vessels through King channel, mooring rings and chains are attached to the rocks at various places, but the channel is now never used without the assistance of steam.

**Queen Channel**, was fordable at low water before it was deepened. Now it is to be preferred to King channel, being more direct and shorter. It is nearly one mile in length and is 70 yards in width, with not less than 13 feet at low water springs. The course through is W.  $\frac{3}{4}$  N. for 2 cables and then N.W. by W.  $\frac{1}{4}$  W. The channel is marked on the north side by *black* buoys, and on the south side by *red* buoys; the extreme of Guide bank on the south side of the channel is marked by a perch.\*

The easternmost *red* buoy, marking the entrance to the channel, is badly placed; a spit with only 4 feet over it projecting outside it in an E.N.E. direction one quarter of a cable.

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\* It is intended shortly to erect a small lighthouse in lieu of the perch.

Tide gauges are erected on the north or Kilkenny shore at each end of Queen's channel, to indicate to an approaching vessel the depth of water through. They are placed at a sufficient distance to allow of a vessel anchoring, if there is not sufficient water.

After Queen's channel has been passed, a vessel may continue on without danger or obstruction to Waterford, a distance of 2 miles. In the bight so near there there is a hole with 11 and 12 fathoms water, and near Cromwell rock, where the channel is but one cable in width, there is a similar depth. In other parts the depths vary from  $3\frac{1}{2}$  to 7 and 8 fathoms, the whole affording excellent anchorage.

Every creek extends N.W. and S.E., three-quarters of a mile in length. The widest part (opposite the custom-house) is nearly  $1\frac{1}{2}$  cables between the two water changes. Here vessels of the largest class may lie afloat at their anchors. A flat extends from the shore in front of the quays to near mid channel, with 13 feet water over it, and 4 fathoms between it and the Kilkenny shore. In mid channel, to the north-west of this flat, there are 6, 7 & 8 fathoms water, and to the south-east of it, near Cromwell rock, 12 fathoms.

The city of Waterford is of considerable size, and was formerly surrounded by a wall, remains of which with some of the towers are still existing. Of its various churches and chapels the spire of the cathedral is most conspicuous. From Hook lighthouse to Waterford, by the river, the distance is 16 miles, from Passage  $7\frac{1}{2}$  miles, and from Cheek point 5 miles. From Hook bay, which is the nearest part of the sea coast, is 6 miles distant. The principal articles of produce are bacon and beer. The exports are almost wholly agricultural, consisting of bacon, pork, butter, grain, flour, meal, cattle, sheep, and pigs.

In 1876, the arrivals were, coastwise, 1,750 vessels=436,552 tons; foreign, 138=70,050 tons. Sailings, coastwise, 1,860 vessels=480,167 tons; foreign, 69=28,305 tons. Belonging to the port, steam-vessels 23=8,401 tons; sailing vessels 76=6,069 tons. Population in 1871, 23,202.

Waterford possesses railway, steamboat, and telegraphic communication with all parts of the kingdom. Supplies of all kinds are of course abundant. Fresh water may be procured at a rivulet on the Kilkenny shore, near a farmhouse, a short distance to the south-east of Cromwell rock; or at the building yard near the bridge, where a pump has been erected by the Harbour Commissioners, and the water conducted to the boat by pipes and hoses.

Near the bridge, on the Kilkenny side, is an extensive building yard, with a patent slip and every convenience for building and repairing ships. A foundry has been established at the south end of the city, where steam gear is made or repaired. Several iron vessels have been built here.

The quays of Waterford have been described as the finest range in the United Kingdom, extending 1,200 yards in length and being 40 yards wide, with convenient floating stages that rise and fall with the tide; these are rendered necessary from the accumulation of mud preventing vessels approaching close to the quays, and have been found to possess many advantages over lying alongside of a fixed structure.

At the upper end of the quays is the wooden bridge, connecting the Waterford and Kilkenny sides of the river; it is 740 feet long, 40 feet wide, and its centre arch is  $12\frac{1}{2}$  feet above the level of ordinary springs. A drawbridge, situated close to the south or Waterford shore, affords a clear passage through,  $28\frac{1}{2}$  feet wide, with a depth of 25 feet water. Another draw or swivel bridge, 40 feet in width, has been constructed about the centre of the bridge; it possesses greater capabilities than the old one, and is more advantageously situated for vessels passing through.

The Suir above Waterford bridge continues a noble river for some miles, presenting hardly an impediment to its navigation by large vessels, until Portlaw creek is approached; about one mile below which is a gravelly bank which uncovers at low water, leaving a very narrow channel along the east shore. At Portlaw there is an extensive cotton factory. Vessels of 11 feet draught may lie afloat off the mouth of Portlaw creek a little north of Polrone.

Above Portlaw, the bed of the river is encumbered by a series of extensive sand-banks, having narrow channels between them. As a general rule the deep-water channels wind round the bights of the river, the salient points, which deflect the ebb stream in that direction, being shallow.

Vessels of 9 or 10 feet draught go up to Piltown; where is 13 feet rise of tide, and a vessel of 7 or 8 feet draught may lie afloat moored head and stern, or secured alongside the island of Fiddown. The deep-water channel is close to the bank. About 3 miles below Carrick the bed of the river is nearly dry at low water.

At Carrick the river is crossed by a stone bridge, and about a mile above it the tidal flow ceases, when the navigation is continued by canal to Clonmel.

A good river pilot may be had at Mount Congreve; the bargemen also are well acquainted with the river.

**TIDES.**—It is high water, full and change, at Waterford bridge, at 6h. 6m.; springs rise  $13\frac{1}{2}$  feet, neaps  $10\frac{3}{4}$  feet. At Carrick, at 7h.; springs rise  $6\frac{1}{2}$  feet, neaps  $4\frac{3}{4}$  feet.

**Directions.**—To sail a ship of heavy draught up to Waterford, it will be necessary to take into consideration the state of the tide, so as to insure having sufficient depth of water to cross Cheek point bar.

Steam ships, and sailing vessels with a fair wind, may proceed without a pilot, but as skilful pilots are always in attendance at Passage, and the rates are low, no stranger would be justified in incurring the risk consequent on going without one.

Passing Cheek point, which is steep-to, steer N.N.W.  $\frac{1}{4}$  W. until the flour mill, a large white building near the water west of Snowhill house, comes in line with the high-water boundary under Snowhill, W.  $\frac{3}{4}$  N., which will lead across the bar in the best water, 11 feet at low water.

Having crossed the bar, and deepened the water to 3 or 4 fathoms, proceed on a mid-channel course, hauling round to the West, W.S.W., and S.W., through the windings of Glasshouse reach, leaving the *red* buoys of the Bingleies and Bolton rocks on the port hand. The tide gauge is on the starboard hand, nearly abreast the buoy on Bolton rocks. If it shows water enough in Queen channel, enter between the *black* and *red* buoys, keeping rather nearer the *black* buoys on the starboard or Kilkenny shore. When fairly entered, steer W.  $\frac{3}{4}$  N. for 2 cables, and then N.W. by W.  $\frac{1}{4}$  W., keeping midway between the *black* and *red* buoys. The bottom is hard, irregular, and not favourable for vessels taking the ground. Do not get out of the fairway, as the shore is rocky in places, particularly to the southward of the second *red* buoy from the eastward, close to which a rock uncovers at low water.

Having passed the western buoys of Queen channel, the water immediately deepens to 8 and 9 fathoms. From hence proceed on a mid-channel course clear of all danger to Waterford.

To go through King channel, continue on a S.W.  $\frac{3}{4}$  W. course from Glasshouse reach, bring the east end of the row of houses at Glasshouse in line with a white cottage on the side of Drumdowney hill (a little to the left of the summit) bearing N.E. by N. Steer S.W. by S. with this mark on, until a thatched cottage (near the shore at Ballynakill and seen a little to the left of the only tree on the summit of the hill), comes on with the bluff point on the south side of the channel, bearing W. by S.  $\frac{1}{4}$  S., this leads over the bar in 13 feet at low water. Or steer so as to pass from half to three-quarters of a cable to the southward of the *black* buoy on the island shoal, and along the south shore at a distance of one-third of a cable from the mud, where the deepest water is found. The rocky point on the port shore is steep-to, with 11 fathoms abreast it.

If proceeding up in a long steamer with an ebb tide, after passing this point keep close to the south shore, which is steep-to, and be careful to port the helm in time, or, with the ebb tide setting against the starboard bow, it will be difficult to fairly enter the next reach.

Leave the *red* buoy on Maulus rock on the port hand; the *black* buoy

on Golden rock on the starboard hand, and the *red* buoy on Dirty tail on the port hand.

There is a *black* buoy close to the low water margin on the west side of the south point of the island, which has not been enumerated here : it seems intended for a warping buoy.

Arrived at Dirty tail buoy, do not haul too suddenly round the point, in order to clear the north end of the shoal. Should the buoy be away, steer N.N.W.  $\frac{1}{4}$  W. for Mayors quay on the opposite shore, or bring Sir John Newport's house on with the right side of the roadway near the quay, bearing N. by W.  $\frac{1}{4}$  W., and steer towards it until the east elbow of the island wall in Queen channel begins to open ; then haul to the westward, and when Cove house opens steer W.  $\frac{1}{4}$  S. towards it.

The turnings of this channel are sudden, and the distances short, and although marks are given, a stranger could hardly hope to pick them up in time to be of service, and where the tides are so strong there is no room for hesitation, but the navigation is perfectly safe to those acquainted with the river. Having arrived at the Cove, the spires and buildings of the city begin to open out, when hauling up N. by W.  $\frac{1}{4}$  W. prepare to anchor.

Men-of-war arriving at Waterford will find a convenient berth abreast the Abbey church. Moor with the Mall open, in from  $3\frac{1}{2}$  to 6 fathoms water, or above the church in the bight on the Kilkenny side, in  $3\frac{1}{2}$  to 5 fathoms, leaving room to swing clear of the mud at low water ; or below Cromwell rock, in the reach to the southward of the city, 2 to 5 cables below the steam-yard, in from  $4\frac{1}{2}$  to  $6\frac{1}{2}$  fathoms water, where is ample room for a number of ships quite out of the way of the numerous steamers and other vessels which crowd the quays. Merchant vessels may drop anchor where convenient for hauling alongside the quays or landing hulks.

**RIVER BARROW.\***—Vessels of 16 feet draught may proceed up to New Ross on spring tides and lie afloat off the quays, but the navigation is intricate, and should on no account be attempted by a stranger without a pilot.† Entering the river, the deep water channel runs close along the western shore, the mark for it is to keep Bolton's house in line with the left side of Garrinbawn rock, N. by W., passing westward of the *black* buoy lying on the outer part of the spit which extends from Kilmokea point, and when the house is hidden by the rock steer on in the same direction, until within 2 cables of the rock, giving it a moderate berth in passing, as it is steep-to. Continue on in mid-channel, in from 6 to 8 fathoms, until abreast Ferry point. The course through the next reach is

\* See Admiralty plan of Waterford harbour, No. 2,046 ; scale,  $m = 3\cdot0$  inches.

† The harbour master states that ships drawing 20 feet now proceed up to New Ross and discharge at the quay. (September 1876.)



N.E. by E. to Dollar point. Here the river expands and becomes very shallow, with not more than 7 feet water in mid-channel. Between Dollar point and Black rock the deep-water channel runs close along the eastern shore, with from 3 to 5 fathoms water; the opposite shore being fronted by a sand-bank called Rochestown spit, that dries half-way across the river. A *red* buoy lies off it about half a cable from the eastern shore. A little above Black rock is convenient anchorage in Carney bay, where large ships discharge part of their cargo before proceeding to New Ross.

Above Black rock another flat is crossed with 8 and 9 feet water. Half a mile below Pink rock the navigation is confined to the western shore by Queen Anne patch, the southern end of which is marked by a *black* buoy.

Pink rock is steep-to there being 6 and 7 fathoms close to the rocks. To the northward of it, Red bank, an extensive sand, dry at low water, occupies the middle of the river. The deepest water is between it and Pink rock, but this channel is circuitous and dangerous, and although there is but 4 feet water over the flats eastward of Red bank the latter is to be preferred as the more direct and safer course. The house on Pink point kept in line with the eastern houses in Carrickloney, S.W.  $\frac{1}{4}$  S., leads between the buoy (*black* with *white* ring) marking the south-west end of Red bank, and a *black* buoy lying about half a cable to the east, and over these flats in the best water. Another *black* buoy lies about three-quarters of a cable north-east of the dry portion of Red bank.

At Stokestown point the river bends suddenly to S.E. by E.  $\frac{1}{4}$  E. for three-quarters of a mile, and the deep water, from 2 to 7 fathoms, is on the south shore. The river then resumes its north-easterly direction, and there is no danger in a mid-channel course until within half a mile of New Ross, when the western shore must be kept on board, until abreast the town; the deep water, 2 to 4 fathoms, is in front of the quays.

**New Ross** is  $9\frac{1}{2}$  miles from Cheek point by the river, and 2 miles below the junction of the Barrow with the Nore. The town is connected with Rosbercon, on the opposite side of the river, by an iron bridge and a causeway. The central portion of the bridge swings, affording two openings of 50 feet each. A brisk trade is carried on. New quays have been erected, which admit vessels of 600 tons register to discharge at all times of the tide. Vessels of small tonnage can proceed by the Nore to Inistiogue, and by the Barrow to St. Mullins, and barges still farther, to Athy, where the junction of the river with the Grand canal affords a water communication with Dublin on the one side, and with Limerick on the other. The port, which had been a dependency of Waterford, was made an independent shipping port in 1840. The principal exports are malt, barley, oats, and pit-wood.

In 1873 the arrivals were 580 vessels of 53,927 tons. The tonnage belonging to the port consisted of 8 sailing vessels of 1,246 tons. Population in 1871, 6,559.

Supplies of every kind can be procured either here or from Waterford, with which there is daily intercourse by steam-vessel.

**Pilots** for New Ross may be obtained at the pilot-station on Cheek point, or by telegraphing from Passage to the pilot-master at New Ross.

The rates are : vessels arriving from or sailing on a foreign voyage, 30 and under 40 tons, 8*s.* to 5*l.* 14*s.* 9*d.* for those of 1,000 tons and upwards. Vessels trading to or from a port in the United Kingdom, 30 and under 40 tons, 5*s.*, to 3*l.* 10*s.* 6*d.* for those of 1,000 tons and upwards, and in proportion for intermediate tonnage.

**Steam tugs** are to be procured at Waterford, and no ship over 170 feet in length should proceed up to New Ross without such assistance.

**TIDES.**—At New Ross, it is high water, full and change, at 6h. 4m.; springs rise 12½ feet, neaps 10 feet.

**The COAST** from Hook point eastward to as far as Bannow bay is of moderate elevation, and, with the exception of Brecaun bridge, already noticed at p. 51, is free from danger.

**Baginbun Head**, 113 feet high, and surmounted by a martello tower, is E. by N. ¼ N., 5 miles from Hook lighthouse, and forms the western boundary of Bannow bay, an extensive tidal inlet, only navigable at high water. Small vessels ascend it to as far as Clonmines, where are some silver and lead mines.

**Ingard Point**, distinguished by a mill on its extremity, is N.E. ¾ N., one mile from Baginbun head; with the wind westerly a vessel may stop a tide in the bight between them, with Baginbun head bearing from S.S.W. to S.W., three-quarters of a mile distant, in 4½ to 6 fathoms, fine sand. Ingard point is foul to some distance; at 1½ cables from it there is but 6 feet water. Immediately within the point is the little village of Ingard and a small pier harbour (dry at low water), which although in a very dilapidated state, affords shelter to fishing boats and coal vessels.

Between Ingard point and Bannow point, on the east side of the bay, there are two dangerous rocks, Shoal and Selskar; the whole space within them is shallow, and in southerly gales presents a mass of broken water.

A vessel standing towards Bannow bay should tack immediately Fethard castle (a turret surmounted by a flagstaff among some trees on the western shore) shows open of Ingard quay, bearing N.W. by W. ¾ W., or not go into less than 6 fathoms water, by which she will keep to the southward of Shoal and Selskar rocks.

**Keeragh Islands.**—The coast eastward of Bannow point is low and rocky, but free from danger, until Keeragh islands are approached. These are two rocky islets  $3\frac{1}{4}$  miles E.  $\frac{1}{4}$  S. from Baginbun head, and one mile from the nearest shore, situated on the extremity of a reef, which uncovers to a considerable extent around. Between them and the shore there is but 8 feet water.

On a line between Baginbun head and Keeragh islands the soundings are pretty regular, being 6 and 8 fathoms over coarse and rocky ground, shoaling gradually up to the shore. A little without this line are two rocky patches with  $4\frac{3}{4}$  and 5 fathoms. All outside of this is clear of danger, the water gradually deepening over rocky and foul ground. There is no danger to the southward of the Keeraghs, and at a cable from them there is not less than 5 fathoms water.

**Barmouth**, the entrance of a long and narrow channel that communicates with the extensive interior shallows of Ballytiege lough, is E. by N.  $\frac{3}{4}$  N.  $1\frac{1}{2}$  miles from Keeragh islands. About midway between is George rock, with only 4 feet water. Barmouth is obstructed by a bar which nearly dries at low water. Immediately within it is a hollow with 7 and 8 feet water, where small vessels may anchor.

**TIDES.**—It is high water, full and change, at Ingard quay, at 5h. 16m.; springs rise 13 feet. The indraught of Bannow bay is felt to some distance outside Shoal rock.

At Keeragh island it is high water, full and change, at 5h. 8m.; springs rise 13 feet, neaps 10 feet. At Barmouth, about a mile within the bar, it is high water at 5h. 53m.; rise on springs 9 feet.

**BALLYTIEGE BAY**, between Hook point and the Saltees, is exposed to south-west winds, and the bottom, of rock and coarse ground, is everywhere unfit for anchorage. Its depths are moderate, shoaling gradually to the shore.

Kilmore castle, on the low rocky point of Crossfarnoge, with the Roman Catholic chapel (spire) at Graigue on the rising ground to the north-west of Barmouth, are conspicuous objects, and with Forth mountain, near Wexford, are seen in clear weather from all parts of the bay.

**Kilmore.**—Crossfarnoge point is foul all round; on its east side is the village of Kilmore, and a small tidal pier for the accommodation of fishing boats. In the immediate vicinity of, and in the approach to the pier, are several detached rocks, some of which uncover at low water.

**Forlorn Rock**, with 4 feet water, S.W. by W.  $\frac{3}{4}$  W. nearly half a mile from the point, is the most outlying danger on this side. Kilmore castle in line with the west end of the rocky shore of Crossfarnoge point, N.E. by E., leads one cable westward of it.

With easterly winds small vessels may anchor in 6 or 7 fathoms, sand and stones, the point bearing from E.S.E. to S.E. from half to one mile

distant. But no stranger should venture near this dangerous shore without the assistance of a pilot.

For upwards of one and half mile to the eastward of the point rocky prongs dry off to the distance of three-quarters of a mile from the high-water boundary. Waterwitch and Spethaun rocks, uncovered at low water, are near the outer edge of this foul ground.

**The SALTEES**, a dangerous group of islands and rocks nearly midway between Hook and Carnsore points, extend from Crossfarnoge point,  $6\frac{1}{2}$  miles in a south-west direction to Coningbeg rock (the outermost danger of the group).

The principal islands, named Little (or North), and Great (or South), Saltee, are separated by a sound, nearly nine-tenths of a mile wide, with 6 fathoms water.

North Saltee, about two-thirds of a mile in length and one-third mile in breadth; attains an elevation of 126 feet, and is connected with the shore near Crossfarnoge point by a reef called Patricks bridge, which dries off a considerable distance from each side. About midway between the island and the shore is a passage over the reef with from 8 to 10 feet water.

South Saltee, about one and a quarter mile in length, and half a mile in breadth, is 195 feet high, and is fringed by outlying rocks.

On the west side of North Saltee are several rocky heads with not more than one foot water over them. The westernmost of these, at the distance of nearly a mile N.W.  $\frac{1}{2}$  N. from the south end of the island, is Jackeen rock, with 6 feet water. Ballytiege castle, in line with the west extreme of the rocky shore of Crossfarnoge point, N.E. by E., leads two-thirds of a mile westward of it, and well outside of all the dangers to the westward of both islands. The beacon on the south point of North Saltee kept in line with its south-west point, or the south point well open, bearing S.E.  $\frac{3}{4}$  E., leads southward of Jackeen rock and the other dangers on the west side of North Saltee.

The dangers in the sound are Goose, Galgee, and Sebbar rocks. The Goose is a half-tide rock, N.W.  $\frac{3}{4}$  W. one cable from the south-west point of North Saltee. The beacon on the south point of the island (built for the purpose by the fishermen), brought in line with the south-west point, marks its position when covered. Galgee rock, nearly dry, is west from the south point, and  $1\frac{1}{2}$  cables from the shore. Sebbar bridge, a shallow ridge of boulders and coarse gravel, runs off from the north end of South Saltee directly across the sound, Sebbar rock on its outer end, with 14 feet at low water, is 6 cables N.N.E. from that island, and N.W. by W.  $\frac{1}{2}$  W. three-quarters of a mile from the south end of North Saltee.

The north shore of South Saltee is skirted by a boulder beach, with

rocky outliers and foul ground extending half a mile from the shore. Between this foul ground and Sebbar bridge a vessel may anchor, if necessary, out of the run of the tides, and sheltered from easterly winds by the islands. Powers rock, however, with only 2 feet over it, and within the above limits, must be carefully avoided. A remarkable black rock on the beach, in line with a quarry in the field over it, S.  $\frac{1}{4}$  W.; and the farmhouse on the island in line with a rocky hill southward of it, bearing S.S.E.  $\frac{1}{2}$  E., mark its position.

Mollyhoy and Panstone rocks are near the west side of South Saltee. The former, covered at high water, is half a cable from the shore: the latter is close to the south point of the island. At the distance of  $2\frac{1}{2}$  cables S.  $\frac{3}{4}$  E. from this point is Sunk rock, with 4 feet water, its position may be always known by the tide-rip over it. The west end of South Saltee open west of the Panstone, N. by E.  $\frac{1}{2}$  E., leads westward of it; and the west point of North Saltee open east of the Makestone, N.E.  $\frac{1}{4}$  E., leads eastward of it.

To the east of the islands are the Bore, Short Bohur, and Long Bohur, three rocky patches, the last named being in the direct fairway of vessels passing through the sound. The Bore, S.E.  $\frac{1}{2}$  E.  $2\frac{1}{2}$  miles from the north-east end of South Saltee, has 19 feet water over it, with 10 and 15 fathoms at a cable's distance all round. Short Bohur, with 4 fathoms water, is between the Bore and Long Bohur. The latter, with not more than 14 feet at low water, and 6 to 10 fathoms at the distance of a cable all round, is S.E. by E.  $\frac{7}{8}$  E.  $1\frac{3}{10}$  mile from the south end of North Saltee. The Makestone on with the south point of South Saltee, W. by S.  $\frac{1}{4}$  S. (view L. chart 2,049), leads northward of it; and Slieve Coiltia, in line with the south-west point of North Saltee, N.N.W. (view K. chart 2,049), leads westward of the Bore.

Of the outlying dangers, the Brandies, Coningmore, and Coningbeg rocks, all lying without or to the southward of the islands, are most in the way of the channel navigation, and their dangerous character is further increased by the rapidity of the tide streams in their neighbourhood.

**The Brandies** are two distinct rocks  $2\frac{1}{2}$  cables apart, with 15 fathoms water between them, and 9 to 13 fathoms within a cable's distance all round. East Brandie, covered at 2 hours flood, is E. by N.  $\frac{1}{8}$  N. 3 miles from Coningbeg. West Brandie covers at  $3\frac{1}{2}$  hours flood. The tide sets past them with great force, and by its overfalls usually marks their position when they are covered.

**Coningmore**, S.S.W.  $\frac{1}{4}$  W.  $1\frac{1}{8}$  miles from the south point of South Saltee, consists of three small detached rocks, the largest elevated 11 feet above high water, and steep-to, with 11 to 15 fathoms water within a cable all round. W. by N.  $\frac{3}{4}$  N.  $1\frac{1}{8}$  miles from Coningmore is Red bank, a rocky

patch of  $4\frac{1}{2}$  fathoms, with 13 and 15 fathoms close-to around it. The tide, in its passage over this bank and the uneven ground to the southward of it, causes great overfalls.

**Coningbeg** (the most outlying danger of the group) is S.W. by W.  $\frac{1}{4}$  W.  $1\frac{1}{4}$  miles from Coningmore, and S.W.  $\frac{1}{4}$  S.  $2\frac{1}{2}$  miles from the south end of South Saltee. From it, Hook lighthouse bears N.W.  $\frac{1}{3}$  W., distant  $11\frac{1}{4}$  miles, the Tuskar E.  $\frac{1}{4}$  N. about  $18\frac{1}{4}$  miles, and Crossfarnoge, the nearest point of the mainland, is distant  $6\frac{1}{2}$  miles. The Coningbeg uncovers 2 h. 8 m. after high water, at low water it measures 90 feet by 30 feet, and is very steep-to, with not less than from 15 to 20 fathoms water within the distance of a cable all round. When covered, its position is generally indicated by the wash over it.\*

**SALTEES LIGHTS.**†—A light-vessel is moored S.W. nearly 2 miles from Coningbeg rock, in 29 fathoms water, and exhibits two *fixed white* lights on separate masts, at elevations of 38 feet on the main, and 28 feet on the fore mast, visible in clear weather at the distances of 10 and 8 miles. She carries two balls. Coningbeg is painted on her sides. During foggy weather a gong is sounded.‡

The depths in the vicinity of the Saltees are very irregular, and the bottom is generally rocky and coarse. On the parallel of Coningbeg rock, and 6 cables west of it, there is a patch of rock with  $7\frac{3}{4}$  fathoms and 18 to 22 fathoms close round it; and again 6 cables farther, in the same direction, there is another patch of 10 fathoms, with similar depths surrounding it. To the westward of these patches the soundings are pretty regular, with from 20 to 23 fathoms over a bottom of coarse sand, stones, and broken shells. On the same parallel, and to the eastward of Coningbeg rock, there are from 25 to 27 fathoms on similar bottom. All to the northward of this is foul ground, in many places rocky, in others coarse gravel and stones. One cable southward of the rock there is 28 fathoms water, and the same depth occurs at  $2\frac{1}{2}$  miles farther in the same direction.

**The COAST** from Crossfarnoge point to Carnsore point (the south-east extreme of Ireland), a distance of  $8\frac{1}{2}$  miles, is low, and encumbered

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\* It was purposed to erect a lighthouse on the Coningbeg, and with this view deep holes were bored in the coarse granite of which it is composed, and massive wrought-iron pillars were erected, the lower shafts of which will, while they stand, constitute a conspicuous beacon, but the project of erecting the lighthouse has been dropped for the present.

† The Commissioners of Irish Lights have given notice that during the summer of 1877, the two fixed lights at present shown will be discontinued, and in lieu thereof one *flashing* white light will be exhibited. The light will show *three flashes* in quick succession *every minute*, the time occupied by the three flashes will be twenty-three seconds, the flashes will be followed by an eclipse of thirty-seven seconds. Also that a powerful siren fog signal will be established at the light-vessel.

‡ See foot note, page 26.

with outlying dangers. Between these points are two extensive lakes, Tacumshin and Lady island lakes, covering an extensive area of submerged lands, which (where not recently reclaimed) are daily covered by the tide. There being no high land near the coast in the south-east portion of the county of Wexford, Forth mountain is everywhere a conspicuous object from the sea.

**Kilturk Bank**,  $3\frac{1}{2}$  miles to the eastward of Crossfarnoge point, has patches of  $2\frac{1}{4}$  fathoms half a mile from the shore, and its outer edge in 5 fathoms is  $1\frac{1}{2}$  miles from the shore. To the south-west of it in the direction of the Long Bohur are some spots of  $4\frac{1}{2}$  and  $4\frac{1}{4}$  fathoms, with 7 and 10 fathoms around them. Saltee sound closing, leads over these in  $4\frac{1}{4}$  fathoms, by keeping the sound a little open it will lead southward of them.

Two and one-third miles to the westward of Carnsore point and three-quarters of a mile off shore is a rocky patch of  $3\frac{1}{2}$  fathoms, with 8 and 9 fathoms between it and the shore. In the same direction  $1\frac{1}{4}$  miles from the point there is  $3\frac{1}{2}$  fathoms on the outer edge of the Combs, a shelf of coarse ground, with from 10 to 12 feet over it. Coasters sometimes stop a tide, about one mile to the westward of the point, in 7 to 10 fathoms water, rocky bottom, with Choir hill bearing N.N.E.  $\frac{1}{4}$  E., but it is an anchorage that cannot be recommended to strangers.

**Black Rock**, 2 miles W.  $\frac{1}{2}$  S. from Carnsore point, is about half a cable in extent, and elevated 6 feet above high water; on the south side it is clear of danger, but 2 cables to the northward of it is a detached rock, the Tercheen, which uncovers at low water.

A bank of fine sand, with 5 to 6 fathoms water, extends one mile to the westward of Black rock, deepening to 9 and 10 fathoms at 3 miles distance. Between it and the shore there are 13 and 14 fathoms, coarse ground. A narrow spit of coarse ground extends from the bank in a south-westerly direction to near the parallel of Coningmore, with from 12 to 15 fathoms water over it, and 20 and 22 fathoms close to on both sides, occasioning a great overfall, particularly with the western stream.

**The Barrels**, S.E.  $\frac{3}{4}$  E., one mile from Black rock, and S.W. by W.  $\frac{1}{8}$  W.  $1\frac{3}{4}$  miles from Carnsore point, and with the Tuskar bearing E.  $\frac{1}{8}$  N.  $7\frac{1}{2}$  miles distant, covers two hours before high water, and is steep-to. A *black* conical buoy, with "Barrels Rock" in white letters on it, lies in 15 fathoms,  $1\frac{1}{2}$  cables S.  $\frac{1}{4}$  E. from the rock, with Nethertown house in line with the coast-guard station on Carnsore point; Tuskar lighthouse bearing E.  $\frac{1}{4}$  N.  $7\frac{1}{2}$  miles; and the beacon on North Saltee, W. by N.  $\frac{1}{2}$  N.  $7\frac{1}{2}$  miles.

**Nether Rock**.—One-third of a mile to the northward of the Barrels is a small rocky patch, called Nether rock, with 16 feet over it at low water.

One cable to the southward of the Barrels there are 17 and 18 fathoms water, and between it and Black rock, 6 to 19 fathoms.

The Tuskar just opening of Carnsore point, E.  $\frac{1}{2}$  S., leads southward of the Combs and other dangers near the shore, and northward of Tercheen and Nether rocks, as well as Black rock and Barrels. Greenore point kept open leads half a mile south-eastward of the Barrels.

**TIDES.**—At Saltee islands, it is high water, full and change, at 5h. 40m. ; springs rise 13 feet, neaps 10 feet.

In Ballyteige bay the stream makes to the eastward  $1\frac{1}{2}$  hours before low water on the shore. In the last hour of its course it slackens and gradually draws round with the sun.

On Long Bohur the stream sets E.N.E. and W.  $\frac{1}{2}$  N. at the rate of  $2\frac{1}{2}$  knots. Each change of tide is attended by an hour's slack. The northerly set of the east-going stream must be guarded against when in this vicinity. The west-going stream does not set into Saltee sound, but runs along the east side of the south island, going round its south end at the rate of  $3\frac{1}{2}$  knots, and causing heavy overfalls on Sunk rock and other dangers.

**Directions.**—Large vessels should always endeavour to pass southward of Saltee light-vessel, but as the rocks are steep-to, small handy vessels may stand much closer to them, or sail between them, if necessary.

Tory hill kept open to the south-west of Baginbun tower, N.N.W. (view E., chart 2,049), leads south-westward of the Coningbeg and Red bank. The north-west side of North Saltee opening north of South Saltee, E. by N.  $\frac{3}{4}$  N., (view C., chart 2,049) leads north-west of Red bank. Ballyteige castle and the west side of South Saltee in line, N.E.  $\frac{1}{2}$  N. (view D., chart 2,049), leads between Coningbeg and Red bank. Coningmore and the west end of South Saltee in line, N.N.E. (view F., chart 2,049), leads eastward of Coningbeg. Coningmore, which is always conspicuous and is steep-to, may be fearlessly passed at a cable's distance. Slieve Coiltia, opening west of South Saltee, N. by W.  $\frac{1}{2}$  W. (view H., chart 2,049), leads between Coningmore and the Brandies; and Slieve Coiltia opening east of South Saltee, N. by W.  $\frac{3}{4}$  W., (view I., chart 2,049) leads eastward of the Brandies. Forth mountain on with the west point of North Saltee, bearing N.N.E.  $\frac{3}{4}$  E., (view G., chart 2,049) leads westward of the Brandies.

Steam vessels, and small sailing vessels with a commanding breeze, may pass through Saltee sound, and inside Tercheen and Nether rocks, by which they will shorten their distance and secure smoother water than by going outside. But in calms, or hazy weather when the marks are indistinct, this must not be attempted, as the tide streams are rapid and the ground unfit for anchoring.

To run through Saltee sound from the westward, when the islands are approached, bring the beacon which will be observed on the south point



of North Saltee island on with the south-west point of the same, or, if the beacon cannot be seen, keep the south point well open, bearing S.E.  $\frac{3}{4}$  E., and steer towards it. This will lead southward of the Jackeen, and north of Sebbar rock, but directly on to Goose rock, to avoid which, when about 3 cables distant from the island, or immediately the bluff point on the east side of South Saltee (near Makestone rock) opens, haul up to the southward, and approach no nearer the south point of North Saltee than 2 cables to avoid Galgee rock.

Having passed through the sound, the course to Carnsore point is E.  $\frac{1}{2}$  S., this will lead one quarter of a mile northward of Long Bohur; the Makestone in line with the south extreme of South Saltee, W. by S.  $\frac{1}{4}$  S., leads half a mile north of it.

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## CHAPTER IV.

SOUTH CHANNEL AND EAST COAST OF IRELAND FROM CARNSORE  
POINT TO DUBLIN BAY.

## VARIATION IN 1877.

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Tuskar	-	-	-	22° 20' W.		Dublin, 22° 45' W., decreasing 9 minutes annually.
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**SOUTH CHANNEL.**—The south entrance to the Irish channel, sometimes called the South channel, is between Carnsore point on the Irish coast, and St. David head on the opposite coast of Wales, bearing from each other S.E.  $\frac{1}{2}$  S. and N.W.  $\frac{1}{2}$  N., 41 miles distant. But the channel fairway is reduced to 33 miles in width by the outlying dangers on each shore.\*

The principal dangers on the Welsh side are the Smalls and Bishops. The former marked by a *fixed white* light, at an elevation of 115 feet, visible 15 miles; the latter by a *revolving white* light, which attains its greatest brilliancy every *twenty seconds*, elevated 144 feet, visible 18 miles. Bais bank also lies north-eastward of the Bishops. The dangers on the Irish shore consist of the Saltees group, described at page 65, with Tuskar rock and banks to the northward of it.

Approaching the South channel. When to the westward of the meridian of Hook point, the bottom is generally coarse, with a mixture of stones, gravel, and broken shells. Between the meridian of the Hook and that of the Saltees, there is a belt of fine dark sand and mud 10 or 12 miles in width, the ordinary fishing ground of the Dunmore trawlers, to the eastward of which the bottom is composed of yellow quartz sand. By attention to the lead, these variations of the bottom will warn a vessel of her progress to the eastward; passing from dark sand and mud to the region of clean yellow quartz sand is a sure indication of having advanced to the eastward of the Saltees. Continuing on an E. by S.  $\frac{3}{4}$  S. course; from the depth of 35 fathoms on the meridian of the Saltees, it increases to 45 fathoms on that of the Tuskar. Between the Saltees and Smalls the depths increase from 30 fathoms within 5 miles of the former, to 65 fathoms

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\* See Admiralty charts of the Irish channel, No. 1,824a; scale,  $m = 0.15$  inch: No. 1,825a; scale,  $m = 0.25$  inch: and No. 1,825b; scale,  $m = 0.25$  inch.

within 3 miles of the Smalls. Between the Tuskar and the Bishops there are from 53 to 56 fathoms in mid-channel, and 40 fathoms within 4 miles of the rocks on each side.

**TIDAL STREAMS.**—Until of late years, seamen generally have not recognised the distinction between high water and the turn of the stream, which may take place sooner or later than high or low water by nearly a whole tide, but seldom with it, excepting at the head of the tide, or end of a tidal inlet, estuary, or harbour.

The tidal streams in the Irish channel were investigated by the late Admiral F. W. Beechey, from whose able paper on the subject, published annually in the Admiralty tide tables, the following statement has been condensed.

The tide from the Atlantic enters the Irish channel by two channels; of which Carnsore point, the south-east point of Ireland, and St. David head, the south-west point of Wales, are the limits of the southern one; and Rathlin and the Mull of Cantyre the boundaries of the northern.

In the Irish channel, notwithstanding the variety of times of high water throughout it, the turn of the stream over all that part which may be called the fair navigable portion of the channel is nearly simultaneous; the northern and southern streams in both channels commence and end in all parts (practically speaking) at nearly the same time; and that time corresponds nearly with the time of high and low water on the shore at *the entrance* of Liverpool and of Morecambe bay, a spot remarkable as being the point where the opposite tides coming round the extremities of Ireland terminate. So that it is necessary only to know the times of high and low water at either of these places, to determine the hour when the stream of either *tide will commence or terminate in any part of the channel*. For this purpose the Liverpool tide-table may be used, subtracting 18 minutes from the times there given, in consequence of the high water at George pier being later than the point which is considered as the head of the tide.

At Saltees lightship, the water is slack 22 minutes before it is high water at Liverpool entrance. The stream sets W.S.W. from one quarter of an hour before high water at Liverpool entrance to  $1\frac{1}{4}$  hours after, and then W.N.W. to low water. The flood or *rising tide* at Liverpool sets past the Saltees for the first three hours E. by S., then E.S.E. for the two next hours, and S.E. by E. for the last hour, when the tide slacks, as before, 22 minutes before high water at Liverpool entrance.

From Saltees light-vessel to the Tuskar the stream sets along the land, but towards Carnsore point begins to tend to the northward on the flood, and finally sets sharply round that point into the Irish channel, and must be carefully watched by vessels in this situation.

At the Smalls lighthouse it is slack water 5 minutes before high water at the entrance of Liverpool; the stream sets past the rock in a S. by W.  $\frac{1}{2}$  W. direction while the water is *falling* at Liverpool, and N. by E.  $\frac{1}{2}$  E. while it is *rising* there, veering to N. by E. during the two last hours of the tide. The strength of the tide is sensibly felt hereabout and all the way from the Smalls to Pembroke, running upwards of  $3\frac{1}{2}$  or 4 knots at the height of the springs. To the southward of the Smalls the stream sweeps round in a broad curve to the S.E., and enters the Bristol channel while the water is *falling* at Liverpool and *vice versâ*.

In the North channel the stream enters between the Mull of Cantyre and Rathlin island simultaneously with that passing the Tuskar into the Southern channel, but flows in the contrary direction. It runs at the rate of 3 knots at the springs, increasing to 5 knots near the Mull, and to 4 knots near Tor point on the opposite side of the channel.

These observations do not, however, extend beyond the points where the channels begin to open out, that is, beyond a line joining Rathlin and the Mull of Cantyre on the North, and the Saltees and Pembroke on the south. Outside of these limits the waters diverge right and left.

**Directions.**—In thick or hazy weather the South channel must be approached with extreme caution, and no vessel should confidently run for it without having first made the Tuskar or the Smalls, or the land in their vicinity.

Although the necessity of an unremitting attention to the use of the lead in thick weather has been before noticed, it may be repeated here that such attention is of the greatest importance, as it affords the mariner the only certain indication of his safety or danger, and contributes to relieve his mind in some degree from the anxiety he must feel while his vessel continues within the limits of this dangerous navigation.

A vessel from the westward, having arrived in the vicinity of the Saltees, and making a lighthouse in hazy weather, must be careful to ascertain whether it is the Hook or the Tuskar before she alters her course, an error in this respect having proved fatal to some vessels, while others have become dangerously embayed and entangled among Saltee rocks. Hook lighthouse may be known by its three *red* belts; the Tuskar is a *white* tower. By attention to the lead, however, this mistake may at all times be avoided, as the water is much deeper in the vicinity of the Tuskar than at an equal distance from the Hook.

By not shoaling the water to less than 35 fathoms, a vessel will pass 7 or 8 miles to the southward of Saltees light-vessel, and by sounding at proper intervals will know when she is crossing the belt of fine dark sand and mud before alluded to. In her progress to the eastward she will deepen her water. Should a vessel advance so far as to increase the depth to

60 fathoms, it will be an indication of having neared the Smalls, and she must accordingly haul to the northward, proceeding with the utmost caution until her position is ascertained. From Saltees light-vessel, an East course for 19 miles will carry a ship about  $1\frac{3}{4}$  miles to the southward of the South rock of the Tuskar, and about the same distance from the Brandies and Barrels. It must be borne in mind, however, that the flood tide sets towards these dangers, for which, particularly in light winds, due allowance must be made. Do not approach within 2 miles of the Tuskar until it bears northward of N. by E.  $\frac{3}{4}$  E., to clear South rock. In fine weather, a vessel may pass within half a mile to the eastward of the Tuskar. In thick weather approach it no nearer than the depth of 40 fathoms.

**TUSKAR ROCK** is the most outlying danger eastward of Carnsore point. Besides the principal rock which is elevated 15 feet above high water, there are several smaller rocks, together covering an area of about 300 yards by 150 yards. To the eastward the rock is steep-to. On its north, south, and west sides there are some straggling heads 2 cables distant from the lighthouse, one of which uncovers; the others have from 7 to 18 feet water. The best landing-place is generally on the west side of the rock; the light-keeper will direct a boat to the spot which at the moment seems most favourable.\*

**LIGHT.** — A circular white tower, stands on Tuskar rock, and exhibits at an elevation of 101 feet, a *revolving* light, showing *two white* faces in succession, and then a *red* face, at intervals of *one minute*. The *red* light appearing every third minute is visible at the distance of 10 miles, the *white* light at 15 miles. In foggy weather a bell is sounded every half minute.

**South Rock**, a dangerous outlier from the Tuskar, with 7 feet water, is two-thirds of a mile S.W. from the lighthouse, and must be carefully avoided by vessels reaching in to the southward of the Tuskar. South rock is marked by a *red* conical buoy, with staff and globe, and name in white letters, moored in 25 fathoms, S.W. by S.  $1\frac{1}{2}$  miles from Tuskar lighthouse. In the absence of the buoy, the south dip of Forth mountain kept to the southward of a road running down to the shore, northward of Ballytrent house, bearing N.W. by N., leads half a mile southward of the rock. The line of this mark must not be crossed or the lighthouse approached within  $1\frac{1}{2}$  miles, while bearing between N. by E.  $\frac{3}{4}$  E. and N.E. by E.  $\frac{3}{4}$  E., particularly with the flood tide which sets strongly over South rock.

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\* See Admiralty chart, Ireland, sheet xv., Wexford to Wicklow, No. 1,787; scale,  $m = 0.9$  inch. Also, plan of Wexford South bay, on chart of Irish channel, sheet 2, No. 1,825b.

**CARNSORE POINT**, the south-east-point of Ireland, and turning point into the Irish channel, is a rocky point of 54 feet elevation. Both to the westward and eastward of it there are outlying dangers, which a vessel entering the Irish channel must be careful to avoid. Those to the westward have already been described.

**Fundale Rock**, uncovered at half-tide, and steep-to, and marked by a perch, is E. by N.  $\frac{1}{4}$  N. one mile distant from the point, and four-tenths of a mile from the nearest shore.

**Collough Rock**, with 2 feet water, is E. by N.  $\frac{3}{4}$  N.,  $1\frac{1}{2}$  mile from Carnsore point, and E.  $\frac{3}{4}$  S. half a mile from Crossfintan point. Between this rock and the shore there is a passage with  $4\frac{1}{2}$  fathoms water fit for boats only, outside it is steep-to. Black rock, kept open of Carnsore point, W.  $\frac{1}{2}$  S.; and Ballytrent house, open east of Whilkeen rock, North (view M., chart 2,049), clears both the Collough and Fundale, southward and eastward.

**Whilkeen Rock**, awash at high-water springs, is three-quarters of a mile northward of the Collough, and four-tenths of a mile from the shore, and forms the extremity of a reef, which partially uncovers at low water. To the north-east and east of it foul ground extends to the distance of 2 cables.

**Anchorage.**—The space between the Collough and Whilkeen, known as St. Margaret bay, affords good anchorage for small vessels with off-shore winds, the Whilkeen bearing N.N.E.  $\frac{3}{4}$  E., 2 or 3 cables distant, in from 3 to 4 fathoms, on clean sand. With the wind southward of W.S.W. a heavy swell rolls in. There is also anchorage northward of the Whilkeen, in from  $5\frac{1}{2}$  to 6 fathoms, with the Glebe house (a large white house on Crossfintan point), in one with the Whilkeen, and not nearer the latter than half a mile, sheltered from N.E. by N. to W.S.W.

**Life-boat.**—A life-boat is stationed at Carnsore point.

**Bailies Prong**, an irregular bank of rocks and coarse ground, extends from off Greenore point in a S.S.W. and S.W. direction 4 miles, nearly midway between the Tuskar and the shore. The tide in its passage over the bank causes heavy overfalls, giving it an appearance of great danger, but there has not been less than  $5\frac{1}{4}$  fathoms found on its rocky pinnacles. It is possible, however, that there may be less, and it would therefore not be advisable for a ship of heavy draught to cross it. Close-to on each side of the bank there is from 12 to 14 fathoms, with 21 fathoms between it and the Tuskar, and 14 to 16 fathoms between it and Wexford shore, on coarse ground.

Coasters and small vessels may pass freely within the Tuskar, by attending to the directions given for clearing the dangers along the shore, but large vessels are recommended always to pass eastward of it.

**GREENORE POINT**, the south extreme of Wexford bay, is distinguished from Carnsore point by its clay cliffs, 66 feet high, and by a windmill and other buildings on its summit; there are also two beacons about one-third mile south-west of it which mark the direction of a telegraph cable, and one mile to the north-west are the piers of Rosslare harbour in course of construction.

Bull perch, a mast surmounted by a circular cage, is on the sand about one mile south-west of Rosslare point.

From the base of the clay cliffs, between the point and the harbour works, ridges of rock extend off in an easterly direction; north-west of the harbour works the foreshore of the bay is of sand.

**Rosslare Harbour.**—A breakwater, which was begun in 1873, is being carried out from the south-west shore of Wexford South bay, at one mile within Greenore point. The works, when finished, will comprise an arm projecting straight from the shore for 1,200 feet in an east-north-easterly direction, continued by a curve northward for 650 feet, and then by another straight arm for 540 feet in a N.W. by N. direction, which latter portion of the work is to be in a depth of 18 feet at low-water ordinary springs. The breakwater will thus afford protection from winds from north-east to south-east, while the cliffs will shelter the harbour from south-westerly winds. The land arm and about 200 feet of the curve have been completed, as well as several miles of the line which will connect the harbour with the Dublin and Wexford railway.

**Light.**—A *white* light is exhibited at the outer extreme of the breakwater works.

**Splough Rock.**—Greenore point is surrounded by dangers, the outer of which is Splough rock, an extensive shoal having 3 feet over its shoalest part, S.E. by S. 6 cables from Greenore point. A *red* can buoy, marked Splough in white letters, lies in 6 fathoms, S.E. by E.  $\frac{1}{2}$  E., 3 cables from the east end of the rock; with Carrick perch, in line with the cliff south-east of Rosslare harbour works, N.W.  $\frac{1}{4}$  N., the perch being distant 8 cables.

**Telegraphic Cable.**—Two beacons, surmounted by diamond shaped boards, and painted *red* and *white* in *horizontal stripes*, with the words Telegraphic Cable in black letters on their centre white bands, are placed on the summit of the cliff south-west of Greenore point, to mark when in line, N.W.  $\frac{1}{4}$  W. and S.E.  $\frac{1}{4}$  E., the direction of a telegraphic cable; this line passes over the south-west end of Splough rock in  $2\frac{1}{2}$  fathoms.

**Carrick Rock** extends E.  $\frac{1}{4}$  S. 4 cables from the extreme of Greenore point; at its outer end is a perch consisting of a single iron rod surmounted by two rectangular vanes pierced with the letters C. R.

**Cawmeens** or **Calmines**, an extensive shoal of rocks with patches of sand amongst them, lies half-a-mile north-east of Greenore point; there is but half-a-foot on their shoalest part. The ground continues rocky and broken fully half-a-mile off shore to where Rosslare harbour works are in progress; and must not be approached nearer than to have the middle peak of Forth mountain in line with the coast-guard station in South bay.

A *red* can buoy, marked Calmines, lies in 24 feet,  $1\frac{1}{2}$  cables from the shoal, with Carnsore point in line with Greenore point, S.W.; and the coast-guard station in line with the middle peak of Forth mountain, N.W.

**WEXFORD SOUTH BAY\*** is formed between Greenore point and Rosslare point. From Greenore point the land is flat, about 60 to 70 feet above the sea, with coast of steep clay cliffs, having a general north-west direction for 2 miles, when the coast gradually trends N.N.E. 5 miles to Rosslare point. The clay cliffs continue about  $1\frac{1}{2}$  miles from the bottom of the bay, and near their termination is the coast-guard station, a large building with a conspicuous central tower, northward of which the land is low, ending in a narrow strip of sand-hills, forming the eastern boundary of Wexford harbour.

**The COAST.**—From Wexford harbour to Blackwater head, 6 miles, the coast is of sand backed by undulating hills, the most conspicuous of which is Ballyrevan, 372 feet high. From Blackwater head to Norris Castle coast-guard station, 6 miles, are clay cliffs 90 to 165 feet high, behind, and about midway along which, is Ballinamona hill, 234 feet high, and northward of the latter Kilmuckridge church.

**Blackwater Head** may be easily recognised, being the abrupt southern termination of the cliffs, with the ruins of a house on its summit. From Norris castle to Cahore point,  $3\frac{1}{2}$  miles, the coast consists of sand-hills. Norris Castle coast-guard station is a conspicuous cluster of white houses.

**Cahore Point** is 63 feet high, with a conspicuous house on its summit, and a coast-guard station on its north side; Ballygarrett Roman Catholic chapel,  $1\frac{1}{2}$  miles inshore to the north-west of the point, is also a conspicuous object from the sea.

**Life-boat.**—A life-boat is stationed at Cahore point.

**HOLDEN'S BED and LONG BANK** form one shoal in front of Wexford South bay; they extend N.E. by N. and S.W. by S.  $3\frac{1}{2}$  miles, with depths varying from 4 to 18 feet; across Holden's Bed, which is at the south part, the bank is three-quarters of a mile wide, but Long bank which forms the north part is only one quarter of a mile wide. Holden's Bed has 5 feet on its shoalest part, and is steep-to on the west side; from it the coast-guard station in South bay bears W. by N.  $\frac{3}{4}$  N.,

\* See Admiralty plan of Wexford harbour, No. 1,772; scale,  $m = 3.2$  inches. Also, plan of Wexford South bay on Admiralty chart, Irish channel, sheet 2, No. 1,825b.



and Greenore point S.W. by S.,  $1\frac{1}{4}$  miles. The shoalest water on Long bank is 4 feet, from which spot Bull perch bears N.W.  $\frac{1}{2}$  N.,  $3\frac{3}{10}$  miles : the positions of these shoal spots can generally be seen by the tide rips and breaking sea over them.

**Buoys.**—Three buoys mark the east side of Long bank, and one buoy the west side of Holden's Bed.

Long bank No. 1 buoy, conical, *red* and *black vertical stripes*, with staff and globe, and its name in white letters, lies in 6 fathoms at the north-east end of the bank, with Rosslare revenue houses seen just south of Bride Street church (south spire at Wexford), W.N.W.,  $3\frac{3}{10}$  miles; Tuskar lighthouse, S.  $\frac{1}{2}$  W.,  $8\frac{2}{10}$  miles; and Lucifer shoals light-vessel, E.  $\frac{1}{4}$  S.,  $4\frac{3}{10}$  miles.

Long bank No. 2 buoy, can, *red* and *black vertical stripes*, with its name in white letters, lies in 9 fathoms half a mile East from a depth of 6 feet, and near the middle of the east side of the bank. From the buoy, Bull perch appears in line with Rowe Street church (the north spire of Wexford), N.W.; Greenore mill, S.W.  $\frac{1}{2}$  W.; and Long bank No. 1 buoy, N.N.E.,  $2\frac{4}{10}$  miles.

Long bank No. 3 buoy, conical, *red* and *black vertical stripes*, with its name in white letters, lies in 4 fathoms at the south end of the bank; Tuskar lighthouse S.S.E.,  $4\frac{1}{10}$  miles; Carrick perch, W. by S., one mile; and Holden's Bed buoy, N.N.W.,  $1\frac{1}{2}$  miles.

Holden's Bed buoy, *black* conical, with its name in white letters, lies in 25 feet, W. by N.  $2\frac{1}{2}$  cables from a patch of 5 feet on the bank; Greenore mill bearing S.S.W.  $\frac{3}{4}$  W.,  $1\frac{9}{10}$  miles; Long bank No. 1 buoy, N.E., 4 miles.

A narrow ridge of sand,  $2\frac{1}{2}$  miles long, with  $3\frac{1}{2}$  to 5 fathoms over it, lies 3 cables east of Long bank, with 7 to 10 fathoms between; its direction is N.N.E. and S.S.W.; Long bank No. 2 buoy, lies one cable within and nearly midway along the ridge.

**Dogger Bank**, which forms the bar of Wexford harbour, is marked on the eastern side by three *black* buoys; one at the north-east extreme; the other two at the east and south-east angles; and Frazer buoy, *black* with a *horizontal white band*, is at the south-west, marking the entrance to Hantoon channel; these buoys are shifted as required to mark the constantly changing form of the bank.

**New Ground**, 2 miles eastward of Long bank, has 19 feet over it near its north end; within this depth it is but a cable long, but within the depth of 5 fathoms it extends N.N.E.  $\frac{1}{4}$  E. and S.S.W.  $\frac{1}{4}$  W. 2 miles. Bull perch, in line with the north fall of Forth mountain, N.W. by W.  $\frac{1}{2}$  W., leads north of New Ground in 7 fathoms. Greenore mill bearing W.  $\frac{1}{4}$  S. leads to the southward in  $6\frac{1}{2}$  fathoms; on this bearing Carrick perch is south of the mill, but being against the land it can seldom be seen.

**LUCIFER SHOALS** lie 5 miles from Rosslare point, with the revenue houses on that point in line with the summit of Forth mountain, W. by N.  $\frac{1}{3}$  N.; this line leads over 20 feet, which is the least water on the shoals. The revenue houses, in line with the south fall of Forth mountain, W.  $\frac{3}{4}$  N. leads north of the shoals in 5 fathoms; and the revenue houses, in line with the north fall of Forth mountain, W. by N.  $\frac{3}{4}$  N., leads south of them in 5 fathoms.

**LIGHT.**—The light-vessel on Lucifer shoals lies in 21 fathoms, E.  $\frac{1}{4}$  S.  $2\frac{4}{10}$  miles from the shoalest water. She exhibits a *fixed red* light, 39 feet above the sea, and visible at the distance of 8 miles. The vessel is painted black with a white stripe and "Lucifer Shoals" in white letters on her sides; she has three masts, with a globe at the main-mast head. A gong is sounded in foggy weather.\* From the light-vessel, Tuskar light-house bears S.W. by S.,  $9\frac{3}{10}$  miles; and Blackwater bank light-vessel, N.E.  $\frac{1}{4}$  N., 10 miles.

**Directions.**—Vessels bound up channel should always pass outside Tuskar rock, and not bring it to bear southward of S.W.  $\frac{1}{4}$  S., or come into less than 20 fathoms; also pass eastward of Lucifer and Blackwater light-vessels. In thick weather, Blackwater bank must not be approached by large ships nearer than the depth of 35 fathoms. If intending to pass through the South Shear into Wexford South bay, vessels may safely go within Tuskar rock by giving the shore a berth of at least a mile, and attending to the marks given for clearing Collough and Fundale rocks on page 75.

As Greenore point is approached be careful not to bring Carnsore point bearing southward of W.S.W., or Carna house to the westward of Whilkeen rock, until the middle peak of Forth mountain is in line with the coast-guard station in South bay, so as to clear Splough rock; in hazy weather do not shoal to less than 8 fathoms. From the eastward, keep the mill on Greenore point bearing W.  $\frac{1}{4}$  S. (on this bearing Carrick perch will be south of the mill, but it can seldom be seen), to clear New ground and Long bank, and run for the South Shear.

**The South Shear or Channel** into Wexford South bay is between Holden's Bed on the north-east, and Greenore point and the rocks off it on the south-west; the channel is half-a-mile wide with 5 to 7 fathoms; the coast-guard station seen midway between the middle peak of Forth mountain and its south fall, N.W.  $\frac{1}{4}$  W., leads in mid-channel; the coast-guard station, in line with the south fall of Forth mountain, N.W.  $\frac{3}{4}$  W. (View II. chart 1,787), clears Long bank in 24 feet, and in line

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\* See foot note, page 26.

with the middle peak of Forth mountain, N.W., clears the Cawmeens and rocks off Greenore point and the coast north-west of it.

The vanes of the mill on Greenore point kept in sight over the land is the mark used by coasters for clearing Carrick rock and bank. When Carnsore point is shut in a vessel will be within the tail of Long bank, and may stand more to the north, being careful, however, to pass to westward of the buoy marking Holden's Bed, as that shoal is very steep-to; the position of the shoal will generally be seen by the break of the sea or tide-rip over it.

**Anchorage.**—Wexford South bay affords good shelter with winds from South, round by west, to North; but with onshore winds it is an unsafe anchorage, though the sea is somewhat broken by the off-lying banks. The water deepens gradually from the shore to Holden's Bed and Long bank; at one mile from the shore there is a depth of 3 fathoms, and close to the banks 6 to 7 fathoms.

There is good anchorage for small vessels in 4 fathoms, on a bottom of sand over clay, in the south-west part of the bay, with Tuskar light-house well open eastward of Carrick perch, S.S.E.  $\frac{1}{2}$  E.; Kilsoran church, W.S.W.; and the coast-guard station, N.W. by W.  $\frac{1}{4}$  W.

When Rosslare harbour works bear east of South, Tuskar lighthouse in line with Carrick perch, S.E. by S., will lead half-a-mile from the shore in 18 feet, shoaling gradually towards it; small vessels may anchor on this line, and find good holding-ground with Kilsoran church bearing between S.W. by W. and W.S.W.

**The North Shear or Channel** between Lucifer shoals and the south-west end of Blackwater bank, is one mile wide with 6 to 8 fathoms water. The north-east slope of Leinster mountain, in line with Blackwater head, bearing N.N.W.  $\frac{1}{2}$  W., (View III. chart 1,787), clears the south-west end of Blackwater bank in 5 fathoms; the south fall of Forth mountain, open north of the revenue houses on Rosslare point, W.  $\frac{1}{2}$  N., leads through it; and the north fall of Forth mountain, in line with the revenue houses on Rosslare point, W. by N.  $\frac{3}{4}$  N., leads between Lucifer shoals and New ground,—by either of these marks a vessel will be north of Long bank; and when Kilsoran church tower bears S.W. by W., she may steer for it on that bearing between Long bank and Dogger bank, which are steep-to.

**Black** buoys mark the east side of Dogger bank, but there is no guide for the north-west side of Long bank. When Bull perch is in line with Rowe Street church spire, Dogger bank will have been passed; keeping Greenore mill bearing south of S.S.W., will lead clear of the shoal parts of Long bank and Holden's Bed.

If going into Wexford by North bar channel, keep the south fall of

Forth mountain open north of the revenue houses until the bar buoys are seen.

If bound for Hantoon channel look out for the south-east buoy of Dogger bank (it is just south of Bull perch in line with the north fall of Forth mountain), and having rounded it haul up to W.N.W. for Frazer buoy, and when a cable south of the latter anchor in 2 fathoms or proceed up the channel to the harbour.

**WEXFORD HARBOUR**, formed by the estuary of the river Slaney, is a bar harbour difficult of access; it however derives great commercial importance from being the only harbour between Dublin and Waterford, and the outlet of a rich agricultural district; but it is useless as a harbour of refuge.

The water-covered space has been greatly reduced by the embankment of the slob lands, yet more than half the present extent uncovers, and the remainder is shallow, having a general depth of 8 to 12 feet. On Gulbert bar there is but 6 feet; abreast the quays at Wexford there is 20 to 30 feet.

The town of Wexford, about  $3\frac{1}{2}$  miles above Rosslare point, exports grain, cattle, pigs, butter, bacon, oysters, and pit wood. There is a small dock-yard where ships can be repaired, and a patent slip which is capable of accommodating the vessels that frequent the port. In 1875, the arrivals were, coastwise, 659 vessels = 60,972 tons; foreign, 16 = 3,762 tons; and the sailings were, coastwise, 620 vessels = 59,944 tons; foreign, 8 = 2,183 tons. The tonnage belonging to the port consisted of 3 steam-vessels = 93 tons, and 85 sailing vessels = 6,806 tons. Population in 1871, 11,812.

**Supplies.**—Water is difficult to obtain, but all other provisions and stores are abundant.

The Slaney at half-a-mile above Wexford is spanned by an iron bridge, and at Ferry Carrig,  $2\frac{1}{4}$  miles farther up, by a wooden bridge; in both structures there are draw-bridges; there is 8 feet in the channel between the bridges, and the river is navigable for lighters and barges for 11 miles to Enniscorthy.

**Pilots.**—There are pilot, lifeboat, and revenue, stations at Rosslare point; at the pilot station a ball is hoisted when there is a depth of  $8\frac{1}{2}$  feet water on the bar, and an additional ball for every additional 6 inches. Signals made by vessels in the offing for a tug are repeated to the town. The pilots have charge of the buoyage, and shift the buoys as changes occur in the channels.

**The North Channel**\* over the bar has a general W.N.W. direc-

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\* From information supplied by Mr. J. W. Walsh, secretary to the Wexford Harbour Commissioners, 6th September 1876.

tion, it has not so much water in it as Hantoon channel, and there is often more sea in it than in the latter channel.

**Hantoon Channel** trends N.E. parallel to the sandy peninsula, which terminates in Rosslare point, and is protected from the sea by the dry parts of Dogger bank; the buoys in both channels are fairway buoys.

**CAUTION.**—The direction and depth of these channels are subject to constant change, vessels, therefore, should not attempt to enter the harbour without the assistance of a pilot.

**TIDES.**—For tides, see page 88.

The navigable channel to the town is marked on the north or starboard hand by *red* buoys, and a perch, abreast Gulbert bar, on the margin of the channel. On the south side, N.W. by W.  $2\frac{1}{2}$  cables from Rosslare point, is a *red* buoy marking the east extreme of the bank separating the main channel from Coal channel; next is Connor perch, at the north-east angle of the bank, and from it up on the port hand are *black* buoys.

Ballast bank, on the east side of the channel opposite Wexford, is formed of the material dredged from the channel, from which vessels may take in ballast.

About  $1\frac{1}{2}$  cables farther up, and one-third of a cable off the quay, is a small rock, with only 4 feet water over it, marked by a *black* buoy.

Vessels not afraid of taking the ground may anchor anywhere in the harbour excepting on Gulbert bar and near Connor perch, where the ground is foul. Abreast the town, from the dockyard upwards, there is very good anchorage in from  $2\frac{1}{2}$  to 5 fathoms water at half a cable's distance from the quays, and, with the exception of the 4 feet rock before alluded to, everywhere clear. Alongside of the quays vessels lie afloat or water-borne. There is also good anchorage at the entrance of Coal channel, in from 15 to 20 feet water.

**Wexford North Bay** is formed by the low sandy shore north of Wexford harbour, the bottom is sand shoaling gradually towards the shore. In fine weather a vessel may anchor in 5 fathoms with the north-east buoy of Dogger bank bearing South one mile, and the revenue houses on Rosslare point just shut in with Raven point, bearing S.W.

**BLACKWATER BANK** lies from 3 to 5 miles off the shore between Wexford North bay and Norris castle coast-guard station; it is 7 miles long N.E.  $\frac{1}{2}$  N. and S.W.  $\frac{1}{2}$  S. and  $1\frac{1}{2}$  miles broad near the centre. The western side of the bank, having 7 to 12 feet over it, is steep-to, and its position is often shown by the tide-rip and breaking sea over it; to the eastward it deepens gradually to 5 fathoms, but towards the north-east it falls suddenly into 15 fathoms.

**Buoys.**—Four *black* buoys, with their names and numbers in white, mark the south-east side of Blackwater bank; No. 1, conical, with staff and globe, lies in 8 fathoms, 2 cables N.E. by E. from the north-east end

of the bank; No. 2, a can buoy, is in 7 fathoms, S.S.W.  $\frac{3}{4}$  W., 2 miles from No. 1 buoy; No. 3, can, lies in 6 fathoms off the widest part of the bank, N.E.  $\frac{1}{4}$  E.,  $3\frac{1}{4}$  miles from No. 4 buoy, which is conical, and lies in 7 fathoms, S.E. 2 cables from a depth of 5 fathoms at the south-west end of the bank.

**LIGHT.**—The light-vessel on Blackwater bank lies in 20 fathoms E.  $\frac{1}{4}$  N.,  $3\frac{1}{2}$  miles from the north buoy on the bank; she exhibits a *fixed white* light 38 feet above the sea, and visible at the distance of 10 miles. The vessel is painted black with a white stripe, and with "Blackwater bank" in white letters; she has three masts, and carries two globes at her mainmast head. During foggy weather a gong is sounded.\* From the light-vessel, Cahore house bears N.W.  $\frac{7}{8}$  N.  $5\frac{1}{2}$  miles; Lucifer shoals light-vessel, S.W.  $\frac{1}{4}$  S., 10 miles; Arklow bank south light-vessel, N.E.,  $11\frac{4}{10}$  miles.

**MONEYWEIGHTS BANK** lies north of Blackwater bank, separated from it by a channel  $2\frac{1}{2}$  cables wide with 5 $\frac{1}{2}$  fathoms in it; the shoalest water on the bank is  $3\frac{1}{2}$  fathoms; there are strong tide rips over it; at the north end of the rip is a *chequered red* and *black* can buoy in 5 fathoms, with Ballinamona hill bearing West; Ballygarrett chapel, N.  $\frac{3}{4}$  W.; and Blackwater No. 1 buoy, S.  $\frac{1}{2}$  W.  $1\frac{1}{2}$  miles.

**RUSK BANK** is about one mile north-west of Moneyweights bank and lies three-quarters to  $1\frac{1}{2}$  miles off shore; the north-east end of Rusk bank is  $1\frac{1}{4}$  miles S.  $\frac{3}{4}$  W. of Cahore point, and extends S.W.  $\frac{1}{2}$  S.,  $2\frac{3}{4}$  miles, with a breadth of 3 cables; there are depths of 8 to 12 feet over  $1\frac{1}{4}$  miles of the bank, which is steep-to on both sides.

**Buoys.**—Rusk bank is marked by three *black* buoys, each with *white belt* and name in black letters on the belt. The south-west or No. 3 buoy is conical, and is moored in 5 fathoms W. by S.  $1\frac{9}{10}$  miles from Moneyweights buoy, with Cahore house bearing N.N.E.  $\frac{1}{4}$  E., and Norris castle coast-guard station, N.W. by N. The middle or No. 2 buoy is a can, in 8 fathoms, 2 cables east from a 10-foot patch on the bank. From the buoy Ballygarrett chapel bears N.  $\frac{1}{2}$  W.; Norris castle coast-guard station, W. by N.; and Rusk south-west buoy, S.W. by W.  $1\frac{4}{10}$  miles. The north-east or No. 1 buoy is conical, and lies in 7 fathoms, close to the north-east end of the bank; with Cahore house bearing North; Norris castle coast-guard station, W. by S.  $\frac{1}{2}$  S.; Rusk middle buoy, S.S.W.  $1\frac{1}{2}$  miles; and Rusk south-west buoy, S.W.  $\frac{1}{2}$  S.  $2\frac{8}{10}$  miles.

**Ram Bank** with from 4 to 10 feet over it, extends from the south side of Cahore point,  $1\frac{1}{10}$  miles towards the north end of Rusk bank, leaving a channel between them 4 cables wide.

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\* See foot note, page 26.

**Directions.**—Croghan hill in line with Roney point, and well open of Cahore point, bearing N.  $\frac{1}{4}$  E. (view IV., chart 1,787), leads east of Blackwater, Moneyweights, and Rusk, banks. The north-east slope of Leinster mountain in line with Blackwater head, N.N.W.  $\frac{1}{2}$  W.; (view III., chart 1,787) leads south-west of Blackwater bank, and close to No. 4 buoy. Between Blackwater bank and the shore there are no dangers until as far north as Rusk bank; between the latter and the shore is a good channel called the Sluice, the south-east side of which is marked by the north-east and south-west buoys of the Rusk. When approaching the north-east buoy keep near it to avoid the Ram, which extends south of Cahore point.

**Rusk Channel.**—South-east of Rusk bank is a good channel half-a-mile wide between it and Moneyweights bank; the three Rusk buoys mark the north-west side of the channel, and Moneyweights buoy the south-east side. Between Moneyweights bank and the north-east end of Blackwater bank is a channel one quarter of a mile wide; No. 1 buoy of Blackwater bank marks the south-east side of it, and the tide rips on the Moneyweights the north-west side.

**Courtown.**—From Cahore point for 10 miles northward to Kilmichael point the coast, forming a bay 2 miles deep, is generally rocky and of moderate elevation; at the head of this bay is Courtown, a small pier harbour nearly dry at low water. Near the north side of the bay, 3 miles south-westward of Kilmichael point, Tara hill rises to the height of 817 feet, and forms a conspicuous sea-mark.

**Kilmichael Point** is low and rocky, with a coast-guard station and flag-staff on it, but they are not conspicuous objects. From Kilmichael point Mizen head bears N.E. 8 miles; the coast between, forming a bay  $1\frac{1}{2}$  miles deep, is principally sand; about midway is the town of Arklow at the mouth of the river Ovoca. Behind Arklow and stretching northward are the mountain ranges of Wicklow; the highest, Lugnaquilla, is 3,029 feet high.

**Mizen Head** is a low rocky point, with the ruins of an old tower on its north side. A large portion of the tower fell in July 1873.

From Mizen head Wicklow head bears N.E.  $\frac{1}{4}$  N.  $6\frac{3}{4}$  miles; the coast between is broken, rocky, and, with the exception of Wolf rock, is free of dangers from Mizen head to Ardmore point, a distance of  $4\frac{1}{4}$  miles; but between Ardmore point and Wicklow head rocks and shoal patches extend nearly one mile off shore. Bray head kept well open of Wicklow head leads eastward of them.

Between Kilmichael point and Wicklow head are the following conspicuous objects; Arklow rock,  $1\frac{3}{4}$  miles southward of the town of Arklow,

is an isolated hill, 402 feet high ; the tall chimney of the chemical works at Arklow ; Ballymoyle, 3 miles northward of Arklow, a large flat-topped hill, 915 feet high ; and Collon top, 4 miles south-westward of Wicklow head, an isolated hill, 776 feet high ; these objects, together with Tara hill south-west of Kilmichael point, and Wicklow head to the northward, may be easily distinguished against the distant background of the Wicklow mountains.

**GLASSGORMAN BANKS** cover the shore between Courtown and Kilmichael point, their outer edge being at the distance of 3 miles off Courtown to  $1\frac{1}{2}$  miles off Kilmichael point ; the shoalest part, with 6 to 12 feet, is off Kilmichael point, with the point bearing between W.S.W. and N. by E. ; there is a channel between the banks and the point nearly half a mile wide.

**Buoys.**—Three buoys, with *red and white vertical stripes*, mark the east side of the banks :—No. 1 buoy, conical, surmounted by staff and globe, lies in 8 fathoms, N. by E.  $\frac{1}{2}$  E., three-quarters of a mile from the 6-foot patch on the banks. From the buoy, Kilmichael staff bears W.  $\frac{3}{4}$  S., and the tall chimney at Arklow N.  $\frac{1}{2}$  W. No. 2, a can buoy, is in 10 fathoms off the east elbow of the banks, South, three-quarters of a mile from the patch of 6 feet ; No. 1 buoy bearing N.  $\frac{1}{2}$  E.  $1\frac{1}{2}$  miles. No. 3 or South buoy, conical, lies in 5 fathoms at the south end of the bank, with a conspicuous white house south of Courtown bearing W.N.W., over 3 miles ; and No. 2 buoy, N.E.  $\frac{1}{2}$  N.,  $5\frac{1}{10}$  miles.

**Directions.**—The channel inside Glassgorman banks is about  $2\frac{1}{2}$  miles wide off Courtown, narrowing to half-a-mile off Kilmichael point ; in the southern half the depth increases gradually from the shore toward the banks, near which there are 7 and 8 fathoms ; off Kilmichael point the depths vary from 3 to 6 fathoms. When within 2 miles of Kilmichael point, keep Wicklow head old lighthouse north-west of Mizen head tower, N.E.  $\frac{1}{4}$  N. (view VI., chart 1,787), to clear the north-west side of the banks. Give Kilmichael point a berth of one quarter of a mile, and do not go off farther than to bring Mizen head tower between the extreme of Wicklow head and the lower old light tower. Arklow rock, bearing N.W., leads north of the banks ; Slieve Boy mountain in line with Ballydane and south of Courtown piers, N.W. by W.  $\frac{1}{2}$  W. (view V., chart 1,787), leads south of them.

**Anchorage.**—Vessels may anchor off Pollduff, northward of Cahore point, in  $5\frac{1}{2}$  fathoms, with Cahore point bearing S.S.W. half a mile. Also off Courtown at the distance of one mile or  $1\frac{1}{4}$  miles from the shore, in from 6 to 7 fathoms water, on clean sand. In south-west gales, the best shelter will be found northward of Roney rock, with Cahore point in line



with the rock, S. by W. ; or the point bearing from S. by W. to S.S.W., at the distance of half to three-quarters of a mile from the shore, in 4 to 5 fathoms.

**ARKLOW**, at the entrance of the river Ovoca,  $3\frac{1}{2}$  miles northward of Kilmichael point, is the shipping port of the surrounding mining district, and the resort of a great number of fishing vessels, which in 1873 gave employment to 1,250 men and 250 boys. Two parallel piers, 120 feet apart, have been carried out to as far as the shoal water of the bar, where they curve gradually to the northward. The bar is generally navigable for boats and vessels of 50 tons at high water, but after a continuance of S.W. winds and dry weather it silts up so as to be impassable to boats. Immediately within the north pier is the tall chimney of Arklow chemical works.

**Anchorage** will be found in 6 to 7 fathoms at half a mile from the shore, with the tall chimney of Arklow bearing W.N.W. There is no shelter with winds between N.E. by E. round by east to S.W. by S.

**Life-boats** are stationed at Courtown and Arklow.

**The WOLF**, a half-tide rock, extending 3 cables in a southerly direction from Ardmore point, and nearly 4 cables from the shore abreast, is foul, and must not be approached nearer than half a mile or to the depth of 6 fathoms.

**The HORSESHOE**, a bank of coarse gravel and stones, extends  $1\frac{1}{2}$  mile S.S.W.  $\frac{1}{4}$  W. from Wicklow head, leaving a narrow passage between it and the shore, with from 4 to 5 fathoms water. On its shallowest part near the north end there is little more than one foot water. A *black* buoy is placed near its south-east edge in  $4\frac{1}{2}$  fathoms, with Wicklow light-house bearing N.  $\frac{1}{4}$  E., and Mizen head S.W.  $\frac{1}{3}$  W. Bray head kept well open of Wicklow head leads eastward of it.

**ARKLOW BANK** is a ridge of sand 3 cables wide, extending 11 miles N.N.E.  $\frac{1}{4}$  E. and S.S.W.  $\frac{1}{4}$  W., at from 4 to 6 miles from the coast; the northern half of the bank is the shallowest, having many spots on it of 2 feet and under; the southern half has from 3 feet to 5 fathoms over it; both sides of the bank are steep-to, quickly deepening to 17 and 20 fathoms. This bank is liable to change; vessels wrecked upon it, either sunk under the sand, or are driven over it and go down in deep water.

**Seven Fathoms Bank.**—At  $1\frac{1}{2}$  miles within, and abreast the mid-portion of, Arklow bank, is a patch, 2 miles long and 4 cables wide, having from 8 to 10 fathoms water over it, and from 14 to 18 fathoms around it; it is still known as Seven-fathoms bank. With this exception the water shoals gradually from Arklow bank to the shore.

Outside Arklow bank the depth of 20 fathoms is found about one quarter of a mile from its south end, and the same depth occurs three-quarters of a mile from its north end ; where, however, at the distance of one mile it shoals to 14 and 12 fathoms, deepening again to 20 fathoms at  $2\frac{1}{4}$  miles distance.  $1\frac{1}{4}$  miles S. by E.  $\frac{1}{4}$  E. from the north light-vessel is a spot with 9 fathoms water, deepening to 20 fathoms in a short distance to the eastward. In thick weather, Arklow bank should not be approached nearer than the depth of 35 fathoms.

**Buoys.**—Five *red* buoys mark the east side of Arklow bank, each with its name and number in white letters :—No. 1 or north buoy, conical, with staff and globe, lies close to the north end of the bank, in  $5\frac{3}{4}$  fathoms ; with Wicklow head light bearing N.  $\frac{3}{4}$  W. 5 miles ; Mizen head tower, W.  $\frac{1}{4}$  S. ; and Arklow bank north light-vessel, S.E. by E.  $\frac{3}{4}$  E.,  $3\frac{2}{10}$  miles. No. 2, a can buoy, is one mile east of the bank, in 17 fathoms ; with the tall chimney of Arklow in line with Annagh hill, W.  $\frac{1}{2}$  N. No. 3, a can buoy, is one mile east of the bank, in 21 fathoms ; with Arklow rock in line with Annagh hill, W. by N.  $\frac{1}{2}$  N. No. 4, a can buoy, is one mile east of the bank, in 26 fathoms ; with Arklow rock appearing just south of Croghan, N.W.  $\frac{3}{4}$  W. No. 5 is a conical buoy, and lies in 8 fathoms, South, one-quarter of a mile from a depth of 5 fathoms on the south end of the bank.

**LIGHTS.**—**Arklow Bank South Light-vessel**, lying in 26 fathoms, S.S.E.  $\frac{1}{2}$  E.  $1\frac{6}{10}$  miles from the south buoy of Arklow bank, exhibits a *white light revolving every half minute*, at 39 feet above the sea, and visible at the distance of 10 miles. The vessel is painted black with a white stripe, and with “Arklow Bank South” in white letters on her sides ; she has three masts, with a half globe over a globe at her mainmast head. A gong is sounded in foggy weather.\* From the light-vessel, Blackwater bank light-vessel bears S.W.  $11\frac{4}{10}$  miles ; Arklow bank north light-vessel, N.E.  $\frac{1}{2}$  N., 13 miles ; Arklow bank No. 5 buoy, N.N.W.  $\frac{1}{2}$  W.,  $1\frac{6}{10}$  miles ; house on Cahore point, W. by S.  $\frac{1}{2}$  S.  $12\frac{1}{4}$  miles.

**Arklow Bank North Light-vessel**, lying in 18 fathoms, S.E. by E.  $\frac{3}{4}$  E.  $3\frac{2}{10}$  miles from the north buoy on the bank, exhibits two *white fixed* lights, that on the main mast being 38 feet, and that on the fore mast 22 feet, above the sea, and visible at the distances of 10 and 8 miles. The vessel is painted black with a white stripe, and with “Arklow Bank North” in white letters on her sides ; she has three masts, with a globe on the fore, and also on the main, mast head. A gong is sounded in

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\* See foot note, page 26.

foggy weather.\* From the light-vessel, Arklow bank South light-vessel bears S.W.  $\frac{1}{2}$  S., 13 miles; Codling banks light-vessel, N.E.  $\frac{1}{3}$  N., 11 $\frac{1}{2}$  miles; Arklow bank No. 1 buoy, N.W. by W.  $\frac{3}{4}$  W., 3 $\frac{2}{10}$  miles; and Wicklow head lighthouse, N.N.W.  $\frac{3}{4}$  W., 7 $\frac{1}{10}$  miles.

**Directions.**—The light-vessels and buoys in fine weather sufficiently guard the east side of the bank, but vessels should not go within the buoys, as the tides set towards the bank, and within one-quarter of a mile directly over it, at the rate of 4 knots at springs, and 3 knots at neaps, causing overfalls along the whole length of the bank, which may generally be seen. The west side of the bank should not be approached within one mile. In light winds a sailing vessel should not near the bank on either side.

Fairy hill, in line with Wicklow head, N.  $\frac{3}{4}$  W., (view X. chart 1,787) leads east of Arklow bank. Mizen head tower in line with the south fall of Croghan, West, (view IX. chart 1,787) leads northward of Arklow bank. The second hill north of Slieve Boy, just seen over the south slope of Tara hill, N.W. by W.  $\frac{7}{8}$  W., (view VII. chart 1,787) leads southward of Arklow bank. Arklow rock in line with the second saddle north of Croghan, N.W. by N., (view VII. chart 1,787) leads south-westward of the bank.

**TIDES.**—It is high water, full and change, at—

		h.	m.		ft.	in.		ft.	in.
Tuskar lighthouse	-	5	45	Springs rise	9	0	Neaps rise		
Wexford, South bay	-	5	40	„	6	0	„	4	0
„ Rosslare point		6	30	„	5	0	„	3	6
„ town	-	7	21	„	5	0	„	3	6
Pollduff	-	7	0	„	4	0	„	2	6
Courtown	-	-	-	„	3	8 $\frac{1}{2}$	„	2	1
Kilmichael point	-	8	0	„	4	3	„	2	3
Arklow harbour	-	8	0	„	4	0	„	2	9
„ bank	-	8	0	„	3	6	„	3	0
Wicklow	-	10	29	„	9	0	„	6	6

At Pollduff, Kilmichael, and Arklow, there is at neaps a double half-day tide, the extent of its range being small and the time uncertain.

**Tidal Streams.**—In the following remarks the end of the ingoing stream is referred to the time of high water at Liverpool, with which it more nearly accords than with the times of local high water; beyond the distance of one mile east of the banks the duration of both streams is 6 hours.

From observations made at the light-vessels it is found that the north-east or ingoing stream ends before high water at Liverpool, as follows:

\* See foot note, page 26.

Position.	N.E., or ingoing Stream.		Rate.	
	Direction.	Ends before Liverpool High Water.	Springs.	Neaps.
Saltees, or Coningbeg, light vessel.	E. by S. to S.E. by E. W.S.W. to W.N.W.	H. M. 1 5 —	Knots. $1\frac{1}{2}$ $1\frac{1}{2}$	Knots. $2\frac{1}{2}$ $1\frac{1}{2}$
Lucifer do. -	N.E. S.W.	1 20	3 $2\frac{1}{2}$	$1\frac{1}{2}$ $1\frac{1}{2}$
Blackwater do. -	N.E. S.W.	0 50	$2\frac{3}{4}$ $2\frac{1}{2}$	$1\frac{1}{2}$ 1
Arklow, S. do. -	N.E. S.W.	0 50	$2\frac{3}{4}$ 3	$1\frac{1}{2}$ $1\frac{1}{2}$
Arklow, N. do. -	N.E. S.W.	0 45	$3\frac{1}{2}$ 3	$1\frac{3}{4}$ $1\frac{1}{2}$
Codling do. -	N.E. S.W.	1 30	3 3	$1\frac{3}{4}$ $1\frac{1}{2}$
Kish do. -	N.E. S.W.	1 15	$1\frac{1}{2}$ 2	$2\frac{1}{2}$ $1\frac{1}{2}$

After passing the Saltees, the stream runs in the direction of the Tuskar, setting sharply round it, and then takes a N.E.  $\frac{1}{2}$  N. direction, setting fairly along the coast at a maximum rate of  $3\frac{1}{2}$  knots. Between the Tuskar and the shore it sets N.E.  $\frac{1}{2}$  E. and S.W.  $\frac{1}{2}$  W., 3 knots at springs, and 2 knots at neaps.

In South Shear, the stream sets N. by W. for 4 hours at the rate of 2 knots at springs, and one knot at neaps; and S. by E. for 8 hours, at the rate of 3 knots at springs, and 2 knots at neaps. The ebb sets round Greenore point, and down over Carrick rock and Splough rock. In South bay the streams are weak, following the trend of the coast, and setting to the N.E. 4 hours, and to the S.W. 8 hours. Within Long bank it slacks  $2\frac{1}{2}$  hours before high and low water at Liverpool.

Wexford harbour.—During the first 3 hours flood in the harbour, the channel stream going to the southward, sets strongly into the harbour over the north bar, but there is little stream in Hantoon channel before the second hour of the flood, when it begins to drain through it from the southward.

At 3 hours flood on the shore, the channel stream changes its course to the northward, and commences to flow rapidly through Hantoon channel, one part going into the harbour, and another out over the north bar,

joining the general channel flood outside. This continues until 50 minutes after high water at Rosslare point, when the ebb begins to make out of the harbour, joining the Hantoon stream, and going together out over the north bar for one hour longer, when it begins to slacken in Hantoon channel, and takes the opposite direction to the southward for the remainder of the ebb.

In moderate weather, the tide does not rise much in Wexford harbour until half-flood, or until the channel stream makes up from the southward, and during the last hour of flood there is very little rise. But with strong northerly winds, and neap tides, the channel stream from the northward often makes high water in the harbour. At such times there is not more than 18 inches rise. Southerly gales have an opposite effect.

From these observations it appears that, during the period the bar is navigable by vessels of 10 feet draught, that is from 2 hours before to 2 hours after high water, the stream is always going to the northward in the Hantoon, and to the north-eastward over the north bar; also that the tide has been falling 50 minutes on the bar when the ebb stream begins to make out of the harbour; so, that, except in cases of a strong northerly wind, sailing vessels must enter the harbour by Hantoon channel, and leave by North bar channel; and when leaving the harbour must encounter the disadvantage of an hour of falling tide before they can arrive at the shallowest part of the bar.

Between the light-vessels and the coast, the stream turns earlier as the shore is approached, at the shore the N.E. stream ending 3 hours before high water at Liverpool; in this space the duration of the streams is uncertain; along the shore the N.E. stream runs longest and strongest on the S.W. side of points; the S.W. stream runs longest and strongest on the N.E. side of points.

Within Blackwater bank, the stream sets N.E. by E., and S.W. by W.,  $2\frac{1}{4}$  knots at springs, and one knot at neaps, and slacks inshore  $1\frac{1}{2}$  hours earlier than in the offing. Both streams set across the banks, the flood outwards and the ebb inwards, at the rate of  $3\frac{1}{2}$  knots on springs and  $1\frac{3}{4}$  knots on neaps, causing a strong ripple on the inner edge of the banks. The stream runs fairly through Rusk and Sluice channels, breaking in overfalls on Moneyweights and Rusk banks.

Near Arklow bank, the stream is very uncertain; in fine weather at springs it sets 7 hours to the E.N.E., at 3 knots an hour, ending  $1\frac{1}{4}$  hours before Liverpool high water; and 5 hours W.S.W., at one knot an hour; there is an hour's slack. At neaps the duration of both streams is 6 hours, E.N.E. 2 knots an hour, ending  $1\frac{1}{4}$  hours before Liverpool high water; W.S.W. one knot an hour.\*

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\* The preceding remarks on tides are by Staff Commander J. H. Kerr, R.N., 1874.

**WICKLOW HEAD**, a bold projecting headland, 234 feet high, may be easily distinguished by two old light-towers on its summit, and by the white walls and buildings of the present lighthouse on its outer slope.

**LIGHT**.—A white lighthouse stands on the outer slope of Wicklow head, from which, at 121 feet above high water, is exhibited an *intermittent white* light, showing bright for *ten seconds* and then eclipsed *three seconds*; it is visible at the distance of 16 miles.

Around Wicklow head the bottom is foul with patches of  $4\frac{1}{2}$  to 5 fathoms, and 8 to 10 fathoms between them, but there is no danger to a small vessel keeping Bray head well open of Wicklow head.

**WICKLOW HARBOUR**,\* a small estuary through which the waters of Broadwater lough discharge into the sea, has a shifting bar on which there is about 8 or 9 feet at high water spring tides; it is used by small coasters trading here with coal, and for pit timber, and ore raised in the neighbourhood; also with the steam corn mill and chemical works. Wicklow, the county town, on the south side of the harbour, is connected by railway with Dublin and Wexford. Supplies to a limited extent may be obtained here. Population in 1871, 3,164.

There is anchorage in Wicklow bay with winds from North, round by west, to S.W., in 4 fathoms, on good holding-ground of clay, with the extreme of Wicklow head just open of Bride head, S. by E.  $\frac{1}{2}$  E., and the entrance to the harbour bearing between West and S.W.

**A Lifeboat** is stationed at Wicklow, and another at Greystones.

**The COAST**† from Wicklow to Bray head a distance of 12 miles is low shingle beach along which the railway runs.

Between Wicklow and Six-miles point, within  $1\frac{1}{2}$  miles of the shore, the depth is less than 10 fathoms, shoaling gradually to the beach; from Six-miles point to Greystones point the depths are irregular, with two shoals, Breaches and Moulditch banks.

**Anchorage**.—Between Greystones and Bray head, there is anchorage with off-shore winds in from 4 to 7 fathoms, clay bottom, at the distance of half a mile from the shore.

**Landing**.—There is good landing at Greystones point, at a little fishery pier, where is also a coast-guard station.

**BREACHES BANK**, with 17 feet at low water spring tides, lies  $1\frac{1}{4}$  miles from the shore, with Wicklow head light bearing S.S.W.; the Breaches, W. by N.  $1\frac{1}{4}$  miles; Moulditch buoy, N.  $\frac{3}{4}$  E.,  $2\frac{3}{4}$  miles.

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\* See Admiralty plan of Wicklow roadstead, No. 52; scale,  $m = 6\cdot7$  inches.

† See Admiralty chart, Ireland, sheet xvi., Wicklow to Dublin, No. 1,467; scale,  $m = 0\cdot9$  inch.

The Breaches are the openings in the coast line to a lagoon or tidal inlet about  $1\frac{1}{4}$  miles north of Six-miles point; they are rendered conspicuous by a dark red railway bridge, which spans them.

**MOULDITCH BANK**, with 14 feet at low water spring tides, is an irregular patch of coarse gravel and large stones, extending three-quarters of a mile from the shore. The town of Wicklow kept open of Six-miles point, S.S.W.  $\frac{1}{2}$  W., leads eastward of the bank; and Great Sugar-loaf, in line with Greystones point, N.W. by W.  $\frac{3}{4}$  W., leads northward of it. Small vessels may pass within it, in 3 fathoms water, by keeping about 3 cables from the shore. The tide rushing over the Moulditch causes overfalls which extend beyond the limits of the bank.

**Buoy.**—A red conical buoy, with “Moulditch” in white letters on it, lies in  $5\frac{1}{2}$  fathoms, a long mile from the shore and 4 cables east of Moulditch bank, with Bray head summit bearing N.N.W.; Great Sugar-loaf seen just north of Greystones railway station, N.W. by W.  $\frac{1}{4}$  W.; and Kilcool railway station, S.W.  $\frac{1}{2}$  S.

**BRAY HEAD**, a conspicuous headland of 722 feet elevation, rises from the sea in bold precipitous cliffs, along the face of which runs the railway. Off the southern extremity of the head, at the distance of a cable from the shore, is Cable rock, uncovered at half-tide, with a few stragglers outside it, and deep water close to. Mapas obelisk kept well open of Bray head leads eastward of Cable rock.

**The Town of Bray**, immediately north of Bray head, until recently a country village, has become a fashionable watering place, with a population in 1871 of 4,563. Its fine terraces and hotels, standing near the shore, are conspicuous objects from the offing. The river Dargle has its outlet northward of the town. At high water small coal vessels pass over the bar of the river, and discharge their cargoes inside.

**The COAST** between Bray and Killiney bay, composed of a shingly beach, is foul, and should not be approached nearer than half a mile, at which distance there will be found from 3 to 5 fathoms water.

**Killiney Bay** is bounded to the north by the remarkable hill of Killiney, on the summit of which stands Mapas obelisk. With off-shore winds vessels may anchor abreast the obelisk in from 5 to 6 fathoms.

**FRAZER BANK** is a ridge of sand lying off Killiney bay at  $1\frac{1}{4}$  miles from the shore; its north end with 5 fathoms is 6 cables South from Dalkey island, it then extends 7 cables S. by W.  $\frac{1}{2}$  W., and is  $1\frac{1}{2}$  cables wide, with a depth of less than 5 fathoms; its shoalest part has 19 feet over it at three-quarters of a mile South from Dalkey island; close outside the bank there are 12 and 14 fathoms, and inside it 6 to 8 fathoms.

The third martello tower southward of Mapas obelisk, in line with Carrickgollogan, W.  $\frac{1}{4}$  S., leads 3 cables southward of the bank in 7 fathoms; Shelmartin (the western peak of Howth), in line with Dalkey tower, N.N.E., leads 3 cables westward in 7 to 9 fathoms; and Shelmartin, open the length of Dalkey island east of the Muglins, N. by E.  $\frac{1}{2}$  E., will lead close eastward of it.

Foul ground with from  $5\frac{1}{2}$  to 10 fathoms extends  $1\frac{3}{4}$  miles southward from Frazer bank, with from 12 to 14 fathoms on either side of it.

#### THE OFF-LYING BANKS BETWEEN WICKLOW HEAD AND DUBLIN BAY.

**INDIA BANK**, of coarse gravel, is two-thirds of a mile in length, and one quarter mile broad; it is steep-to on its western side. The shoalest spot, 2 fathoms, is nearly midway along the bank, on its west side, with Wicklow head bearing W. by S.  $\frac{1}{2}$  S. 5 miles.

**SOUTH RIDGE** extends in a N.N.E. direction to  $1\frac{1}{2}$  miles from India bank, and is about one quarter of a mile broad, with 3 to 5 fathoms water over it, and from 10 to 12 fathoms on either side. From its north end, Wicklow head bears S.W. by W.  $\frac{1}{4}$  W.,  $6\frac{1}{4}$  miles.

India bank and South ridge may be considered as one continuous danger, a narrow swashway with 5 fathoms water alone separating them.

**BUOYS.—India Bank south buoy.**—The south end of India bank is marked by a conical buoy, with *black* and *white horizontal bands*, and its name in black letters, lying in 8 fathoms, S.S.W. half a mile from 5 fathoms; with Wicklow head lighthouse bearing W.  $\frac{3}{4}$  S.  $4\frac{4}{10}$  miles; Great Sugar-loaf, in line with the south side of the Gap, N.N.W., westerly; Codling light-vessel, E. by N., 6 miles; Arklow bank north light-vessel, S.  $\frac{1}{2}$  W.,  $7\frac{1}{4}$  miles; Arklow bank buoy, No. 1, S.S.W.  $\frac{3}{4}$  W.,  $6\frac{3}{4}$  miles.

**Ridge north buoy.**—A conical buoy, painted with *black* and *white horizontal bands*, and carrying a staff and globe, is moored at the north end of the Ridge, in about 8 fathoms, with Great Sugar-loaf bearing N.W. by N., and Wicklow head lighthouse, S.W. by W.  $\frac{1}{4}$  W.

**Directions.**—Great Sugar-loaf in line with the south side of the Gap, bearing N.N.W. (view A., chart 1,467), leads one mile south-westward of India bank; Carrickmarina, in line with the tall chimney north of Wicklow, W. by N.  $\frac{1}{4}$  N. (view A.), leads south of it; Collon top kept midway between Wicklow lighthouse and the old high light tower, S.W. by W.  $\frac{1}{4}$  W., westerly, clears the north end of South ridge, and crosses the south end of Codling banks in  $4\frac{3}{4}$  fathoms.

Great Sugar-loaf open north of the Gap, bearing N.W.  $\frac{1}{2}$  N., leads one mile north-east of South ridge, and between it and Codling banks.



**CODLING BANKS** include a large extent of hard broken ground (probably rock), covered with gravel and large boulders running in narrow ridges, with from 9 to 14 feet water on the shoalest parts, and from  $3\frac{1}{2}$  to 6 fathoms over other portions. The south end of Codling banks is N.E. by E., 3 miles from South ridge, and there is from 10 to 18 fathoms water between them; from hence they run N.  $\frac{3}{4}$  E. 3 miles, and then bend suddenly to the westward for 2 miles. The tide in passing over the shoal causes heavy overfalls, especially with the flood stream.

**Buoys.**—A *black* can buoy, No. 4,\* lies in about 8 fathoms, north-east of Codling banks, with Great Sugar-loaf bearing N.W. by W.  $\frac{3}{4}$  W., and Wicklow head S.W.  $\frac{1}{4}$  W., westerly.

A *black* conical buoy, S.E., or No. 5, is moored in 8 fathoms, on the south-eastern extreme of the bank, with Great Sugar-loaf bearing N.W.  $\frac{1}{4}$  W., and Wicklow head S.W. by W.  $\frac{1}{4}$  W., westerly.

A conical buoy, *striped vertically black and white*, S.W. or No. 6, is moored in about 20 fathoms, near the south-west side of the bank, with Great Sugar-loaf bearing N.W.  $\frac{3}{4}$  W., and Wicklow head S.W.  $\frac{1}{4}$  S.

**LIGHT.**—Codling light-vessel lies in 9 fathoms, S.E. by S., 4 miles from 4 fathoms on the south-east extreme of Codling banks, and exhibits, at an elevation of 39 feet, a *revolving red* light, which attains its greatest brilliancy *every twenty seconds*, and is visible at the distance of 9 miles in clear weather. In foggy weather a gong is sounded.† The hull is painted black with a white stripe, and “Codling bank” in white letters on her sides; she has three masts, with a half globe surmounted by a globe at her main-mast head. From the vessel, Wicklow head bears W. by S. (southerly)  $10\frac{1}{2}$  miles; Arklow bank north light-vessel, S.W.  $\frac{3}{4}$  S.,  $11\frac{1}{2}$  miles; and Kish light-vessel, North (westerly),  $16\frac{1}{2}$  miles.

These three banks, India, South ridge, and Codling, are on the inner, or western side of an extensive flat which covers a space of 10 miles east and west, by 8 miles north and south. The northern portion of the flat for 5 miles east of Codling banks has 5 to 7 fathoms water over it; the remainder has from 7 to 10 fathoms. At the north-eastern and eastern edges are strong tide-rips, and the depth increases suddenly to the eastward from 10 to 30 fathoms: from these tide-rips Codling light-vessel bears about W. by N.,  $4\frac{1}{2}$  miles.

Carrickgollogan, well open of Bray, N.W., (view C., chart 1,467) clears the north-east corner of Codling bank to the north-east.

**Directions.**—With proper attention to the lead these flats will give timely warning of the approach to the dangers within them; but in thick

\* Codling, Bray, and Kish, banks are, with regard to buoyage, considered as one danger.

† See foot note, page 26.

weather a vessel navigating the channel should approach no nearer than the depth of 35 fathoms, and should tack when standing towards the banks, on the first shoal cast.

Outside Bray and Kish banks, and at from 4 to 5 miles distant from them, there is a ridge of sand with from 10 to 15 fathoms water, extending northward from Codling banks. A vessel standing toward Kish bank would probably strike soundings on this ridge, when, if the weather be thick, she should immediately tack. Between it and the Kish there are from 20 to 22 fathoms, the former depth being one mile from the edge of the bank. Within these banks the depths are moderate, with irregular soundings over a bottom of coarse gravel, stones, and sand.

Close along the western edge of India bank and South ridge, there is a deep gully; commencing at the north end of the latter, it runs 7 or 8 miles to the southward, and is three-quarters of a mile wide, with from 22 to 44 fathoms water.

Three-quarters of a mile northward of South ridge, another similar gully commences, and runs close along the inner edge of Codling banks, from whence it branches off to the north-westward; the greatest depth in it, 64 fathoms, is within one-third of a mile of Codling banks. Between these gullies and the shore the depths vary from 7 and 8 to 12 and 16 fathoms, over broken irregular ground, causing strong eddies, and in stormy weather a short broken sea.

**CAUTION.**—The great depth of water along the inner edge of these banks rendering it inconvenient to anchor, vessels must approach them with great caution, particularly in light winds, as the flood tide setting strongly out over the banks might carry them into danger.

**BRAY and KISH BANKS** together form a long narrow bank, composed of sand and boulders over rock, stretching  $9\frac{1}{2}$  miles in a N. by E.  $\frac{1}{2}$  E. direction, and about half a mile broad, with from 6 to 10 feet water over a considerable extent of the northern portion, and from 2 to 3 fathoms near each end. They are steep to on either side, with 9 and 10 fathoms close to, and 12 and 14 fathoms at one quarter of a mile from them.\* The southern end of Bray bank is separated from Codling bank by a channel half a mile wide with 9 fathoms water.

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\* **WRECK LIGHT-VESSEL.**—In order to mark the position of the wreck of H.M.S. *Vanguard*, a light-vessel is for the present moored in 21 fathoms, 2 cables E.S.E. from the wreck, and exhibits at an elevation of 39 feet above the level of the sea a *revolving green light* attaining its greatest brilliancy *every minute*.

The light-vessel is painted green, with the word *wreck* in large white letters on her sides, has one mast, and carries two vertical riding lights on the forestay. In thick or foggy weather a gong is sounded.

On the approach of a vessel steering towards the wreck, a gun will be fired from the light-vessel and repeated until the course is altered. The signal of the Commercial

The tidal streams disturb and carry large quantities of sand from these and the neighbouring banks, especially at springs and during gales of wind, when the water is heavily charged with material.

**Buoys.**—Three buoys mark these banks,\* namely, Kish bank No. 3, *black* can, lies in 17 fathoms, S.S.W.  $\frac{1}{2}$  W.,  $3\frac{1}{4}$  miles from No. 2 buoy; with Mapas obelisk bearing N.W.  $\frac{3}{4}$  N., and Great Sugar-loaf, W. by N. Kish bank No. 2, *black*, can, is  $\frac{3}{4}$  mile eastward of the bank, in 18 fathoms, S.  $\frac{1}{8}$  E.,  $4\frac{4}{10}$  miles from No. 1 buoy; with Mapas obelisk bearing N.W. by W. westerly, and Bailey lighthouse, N. by W.  $\frac{1}{2}$  W. Kish bank north, or No. 1, *black*, conical, with staff and globe, lies in 6 fathoms off the north end of the bank; with Dalkey island tower seen just south of Mapas obelisk, West,  $5\frac{3}{4}$  miles; Howth Bailey lighthouse N.N.W.  $\frac{1}{2}$  W.,  $5\frac{1}{4}$  miles; and a large square house on the south side of Howth on with the highest western peak of the hill; Kish buoy No. 2, S.  $\frac{1}{8}$  E.,  $4\frac{4}{10}$  miles.

**LIGHT.**—Kish light-vessel, moored in 10 fathoms, three-quarters of a mile from the north end of the bank, exhibits, at an elevation of 36 feet, a *revolving white* light, which attains its greatest brilliancy *every minute*, and is visible at the distance of 10 miles in clear weather. During foggy weather a gong is sounded, and when the mail steamer is expected from Holyhead a gun is fired *twice* in quick succession *every fifteen minutes*. The hull is painted black with a white stripe, and with Kish in white letters on her sides; she has three masts, with a ball at her mainmast head.†

From Kish light-vessel, Mapas obelisk bears W.  $\frac{3}{4}$  S.; Kingstown east pier lighthouse, W. by N.  $\frac{1}{4}$  N.,  $6\frac{8}{10}$  miles; Poolbeg lighthouse, N.W. by W.,  $7\frac{3}{4}$  miles; Howth Bailey lighthouse, N.W. by N.,  $4\frac{8}{10}$  miles; Nose of Howth point, N. by W.  $\frac{3}{4}$  W.,  $5\frac{7}{10}$  miles; Wreck buoy, S.W.  $\frac{3}{8}$  W.,  $1\frac{2}{10}$  miles; Burford South buoy, W. by N.  $\frac{1}{8}$  N.,  $2\frac{8}{10}$  miles; Burford North buoy, N.W.,  $3\frac{3}{10}$  miles.

Mapas obelisk, open north of Dalkey tower, bearing West, leads north of Kish bank.

Code, "You are standing into danger," (J.D.) will also be made, and kept flying until answered. Vessels should not pass between the light-vessel and the wreck.

From the wreck, Kish light-vessel bears N.  $24^{\circ}$  W.,  $8\frac{8}{10}$  miles.

" Codling light-vessel bears S.  $19\frac{3}{4}^{\circ}$  W.,  $9\frac{4}{10}$  miles.

" Bray head bears N.  $80^{\circ}$  W.,  $10\frac{8}{10}$  miles.

These bearings place the wreck in lat.  $53^{\circ} 13' 10''$  N., long.  $5^{\circ} 46' 40''$  W.

**WRECK BUOYS.**—Two buoys further mark the wreck; one is placed half a cable S. by W., and the other half a cable N. by E. from the wreck, or at right angles to the hull of the *Vanguard*.

\* Buoys Nos. 4 to 6 are described on page 94.

† See foot note, page 26.

**Directions.**—Vessels from the southward bound to Dublin should, unless well acquainted with the coast, pass outside Tuskar rock and Lucifer and Blackwater light-vessels, when they may proceed to the northward, either inside or outside Arklow bank. Within the banks, with light foul winds, they will be enabled to anchor during the outgoing tide; in anchoring and weighing it is well to remember that the tide in the offing is about  $1\frac{1}{2}$  hours later than inshore; outside the banks the only safe place to anchor for a tide in fine weather is on the shoal ground east of India bank and Codling banks, for which purpose Codling light-vessel is an excellent guide.

Between the Tuskar and Dublin bay the dangerous banks which off-lie the coast are well marked on their outer sides by light-vessels and buoys, which in ordinary weather are efficient guides either by day or night. From the Tuskar to Codling light-vessel is N.E.  $\frac{1}{4}$  N., 54 miles; this bearing passes nearly through a line of light-vessels which are separated from each other by intervals varying from 9 to 12 miles; none of these lights should be brought to bear south of S.W., nor east of N.E.; from Codling light-vessel to Kish light-vessel is North (westerly)  $16\frac{1}{2}$  miles; when north of the Codling it must be kept bearing west of South, and Kish light-vessel west of North. In thick weather great attention must be paid to the tide, remembering that the outgoing stream which is about  $1\frac{1}{2}$  hours earlier than Liverpool, sets directly across the banks; and on no account go into a less depth than 35 fathoms.

**Passage inside Arklow Bank.**—When Croghan hill is in line with Roney point and well open of Cahore point, bearing N.  $\frac{1}{4}$  E., (view IV., chart 1,787) a vessel will be to the eastward of Blackwater bank and the shoals lying between it and Cahore point, and may stand in to within half a mile of the shore in 5 or 6 fathoms water. It must be remembered, however, that the south end of Glassgorman bank extends to abreast Courtown. Then pass to the south-west of Arklow South light-vessel and Arklow bank buoy No. 5, from which the course to abreast Wicklow head is N.N.E., 16 miles, and from thence to Dalkey island N. by E.  $\frac{1}{4}$  E., 19 miles.

Stand towards Glassgorman bank with great caution, keeping Wicklow head well open of Mizen head. From abreast Arklow rock to Mizen head the shore may be approached to the distance of half a mile, and then to within three-quarters of a mile, in 5 or 6 fathoms water, until about 2 miles from Wicklow head, when Bray head must be kept well open of Wicklow head to clear the Horse-shoe. Standing off towards Arklow bank, it must be borne in mind that the deepest water, 15 to 20 fathoms, is near the edge of the bank, and that the flood tide sets strongly out over it. With light winds, therefore, it is advisable to make short tacks along the shore. The

same remarks apply to the off-lying banks north of Wicklow head, therefore stand no farther off shore than 3 or 4 miles when north of that head.

While to the southward of Six-miles point, small vessels may stand towards the shore into 5 fathoms, or within three-quarters of a mile of the beach, larger vessels to 6 or 7 fathoms. To the northward, between Six-miles point and Greystones, a distance of 5 miles, the coast must not be approached nearer than 2 miles to avoid Breaches and Moulditch banks,—off the latter is a *red* conical buoy; when Great Sugar-loaf is open north of Greystones point they will be to the northward of the Moulditch, and may stand in to 7 or 8 fathoms.

Between Wicklow head and Bray head the lead is not a safe guide in thick weather, as between the shore and the off-lying banks the depths are very irregular, there being banks of 6 to 10 fathoms with 14 fathoms between them, and from 30 to 40 fathoms close within India, Codling, and Bray banks. Bray head is steep-to; off its south point is Cable rock which covers at half-tide, and to the northward of it the shore is foul, and for some distance must not be approached within a mile, or to the depth of 10 fathoms. Standing from eastward towards Frazer bank, which is steep-to, tack with Shelmartin, the western peak of Howth, open the length of Dalkey island east of Muglin rocks, N. by E.  $\frac{1}{2}$  E.

In dark or foggy weather, standing towards the Irish banks, tack in 35 fathoms. In fine weather a vessel may stand much closer to Kish bank, tacking in 10 to 14 fathoms on the ridge to the eastward of it. By not decreasing the depth to less than 35 fathoms on the Irish coast, and observing the same rule when standing to the eastward, a vessel will avoid the Irish banks on one hand, and the dangerous bays of Cardigan and Carnarvon on the other. This depth will, however, be found within 2 miles of Bardsey island, and close to the Bishops and Smalls. On a mid-channel course the soundings are very irregular, but by a careful attention to the lead, and comparing her soundings with the depths on the chart, a vessel may not only avoid the dangers near each shore, but may become in some degree acquainted with her progress up channel.

**DUBLIN BAY\*** is  $5\frac{1}{2}$  miles wide between Dalkey island on the south and the hill of Howth on the north, and 6 miles deep to the banks at its head, through which the river Liffey has its outlet.

Approaching Dublin bay from seaward the most conspicuous objects on the south are Bray head and the Sugar-loaf hills within it, Great Sugar-loaf being 1,651 feet high; and on the north, the hill of Howth 563 feet, with the remarkable island Ireland's Eye (326 feet) close to the northward. On a nearer approach, within the south point of the bay, will be seen

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\* See Admiralty plan of Dublin bay, No. 1,415; scale,  $m = 3$  inches.

Carrickgollogan, a conical hill (912 feet); also a tall mine chimney, Mapas obelisk, and a ruined signal tower on the Killiney hills; close off the latter is Dalkey island, 77 feet high, with a martello tower on its summit; by the time these objects are distinguished from a vessel she would be near Kish bank and the light-vessel off its north end should have been seen.

The hill of Howth terminates to the south-east in the Bailey, a bold projecting point with precipitous shores, and a lighthouse on its extremity, forming the north point of entrance to Dublin bay. The Bailey is steep-to, but to the northward of it a flat with 3 to 4 fathoms extends 3 cables from the shore, and to the westward of it the shore is foul for one quarter of a mile off. Sutton creek, a narrow inlet with 12 feet at high-water springs and 9 feet at neaps, runs along the west shore of Howth, and affords shelter to fishing craft.

**Dalkey Island** is the south point of the entrance to Dublin bay. The channel between it and the main, with from 4 to 7 fathoms water, is little more than one cable in width, but is quite safe for steam-vessels. The shore of the main is steep-to, but the reef that extends to the northward of the island has straggling outliers on both sides of it. Vessels passing between Dalkey and the main should keep nearer the latter, or at about half a cable from it.

**The Muglins**, a small cluster of rocks 3 cables eastward of Dalkey island, and 20 feet high, are bold-to except to the westward, where at half a cable's distance is a rock with 4 feet water. Kingstown east pier light in sight leads about half a mile north-east of the Muglins.

To pass between Dalkey island and the Muglins, keep in mid-channel; Sandy cove tower open of the point under Bullock martello tower, clears the reef that extends to the northward of Dalkey island. Neither of these channels can be recommended to strangers, but of the two, that between Dalkey and the main is to be preferred.

**Bullock Harbour**, a little dry harbour between Dalkey and Kingstown, has a rocky approach, and is only occasionally frequented by a few small coal vessels.

The shore between Dalkey and Bullock is clear of danger and steep-to, but between Bullock and Sandy cove point are some outlying rocks one cable off shore. Dalkey island kept well open of the point under Bullock martello tower clears them. Scotch bay, between Sandy cove point and Kingstown harbour, is foul throughout.

**KINGSTOWN HARBOUR.**\*—Kingstown, formerly called Dunleary, received the name it now bears in honour of George IV.'s

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\* See Admiralty plan of Kingstown harbour, No. 1,471; scale,  $m = 20$  inches. Also, plan on chart of Irish channel, sheet 2, No. 1,825b.

embarkation here in the year 1521. Before the harbour works were commenced in 1817, it was an unimportant village, but has now become a large and handsome seaport town, and favourite watering place, and is the Royal mail packet station of the metropolis,  $6\frac{1}{2}$  miles distant, with which it is connected by a railroad. It is also the head-quarters of the St. George and Royal Irish Yacht Clubs, who have handsome club-houses near the shore, and whose squadrons enliven the bay and harbour during the yachting season.

Supplies are of course abundant, or may easily be procured from Dublin. Water may be obtained at a moderate charge on application at the harbour-master's office. It is led down in pipes from a large reservoir to the inner end of the packet wharf, and is supplied by means of a hose.

Kingstown is included in the custom-house jurisdiction of the port of Dublin. Population in 1871, 12,469.

The harbour is formed by two magnificent piers of granite extending from the south-west shore of the bay in the direction of Howth, and enclosing an area of 233 acres; the entrance is 750 feet wide, and there is a lighthouse on each pier head.

Immediately within the entrance, and just north of the fairway, a bank of sand with from 16 to 18 feet over it, extends W.S.W. one cable. The greatest depth of water in the harbour is 22 to 25 feet within the east pier lighthouse, around the moorings appropriated to H.M. guard ship. For 1,000 feet within these moorings there is a depth of  $20\frac{1}{2}$  feet, where vessels may lie with their own anchors ahead and stern chains to the pier; the water then gradually shoals to 15 feet near the western pier.\*

In the western portion of the harbour there is bad holding-ground, and the sea which sets in with easterly gales makes the anchorage unsafe. A

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\* Kingstown harbour, since its examination by Captain Frazer in 1844, has silted up with 4 feet of mud on the eastern side; and to the same amount, but of sand, south three-quarters of a cable from the west pier head and just north of the fairway, where, as above stated, is a patch of 16 to 18 feet. The western part of the harbour remains nearly as in 1844, except an accumulation of a foot of mud along the line of wall immediately west of the west lighthouse, and extending half a cable off.

Outside the harbour, off the east side of the east pier, there is no change. From the shore to the first angle of the west pier, a distance of half-a-mile, an accumulation of 3 to 6 feet of mud exists, probably caused by the drainage of the town into the still water there; off the next 1,000 feet, which has an east and west direction, the ebb tide from Dublin bay has increased the depth 3 to 6 feet within half-a-cable of the pier. The material carried from here, together with mud brought by the current, appears to be deposited around the west pier head, and has formed within the harbour the 16 feet bank of sand before mentioned, and the weak ingoing stream towards the south side of the harbour has probably deposited the 4 feet of mud there; there is no outgoing stream from the harbour.

heavy large-linked safety chain is placed across the harbour in a northerly direction at  $1\frac{1}{2}$  cables from the south-west side of the harbour for vessels' anchors to catch in, in the event of their dragging.

At the head of the old pier of Dunleary on the west side of the harbour there is not more than 5 or 6 feet at low water, and alongside Traders' wharf, 10 and 11 feet. A pier for the accommodation of the mail packets has been constructed on the east side of the harbour, with 19 and 20 feet water alongside it. A line of rails from Kingstown station enables the carriages to run down close to the packets.

**TIDES.**—It is high water, full and change, at Kingstown, at 11h. 12m.; springs rise  $11\frac{1}{4}$  feet, neaps  $8\frac{3}{4}$  feet.

**Directions.**—Vessels seeking shelter here in easterly gales must be careful not to shorten sail until they are well within the pier heads. On rounding into the harbour they must keep their luff, and endeavour to fetch a berth within a cable's distance of the east pier; for if they fall to leeward, where the holding-ground is not good, they will be exposed to the heavy swell, and perhaps drive into shallow water, or alongside of the west pier. During easterly gales a boat is in attendance at the east pier head, to render assistance and direct vessels where to anchor.

Vessels are not allowed to remain at anchor near Carlisle pier, a space of about 600 feet in width being kept clear to allow the mail packets to pass freely in and out. In moderate weather they may bring up anywhere clear of the above limits.

**Pilots** cruise between Arklow South light-vessel and Rockabill in cutter-rigged vessels, with the words "Dublin pilot" on the mainsail and their number, from 1 to 6, on their bows. One boat cruises in the bay. Pilotage is compulsory on all vessels above 50 tons. Steam tugs are always on the look-out, and few vessels enter or leave the port of Dublin without their assistance.

**Life-boats.**—Two life-boats are stationed in Dublin bay.

**LIGHTS.—Kingstown.**—From the lighthouse on the east pier head is exhibited, at an elevation of 41 feet, a light *revolving every half minute, white and red alternately*, visible at the distance of 9 miles. When bearing northward of N.W.  $\frac{1}{4}$  N. it is shaded, to clear the Muglins. During foggy weather a bell is sounded. From the west pier head a *fixed red* light is shown at an elevation of 36 feet, visible 2 miles.

**Poolbeg Light.**—A white tower on the east end of the south wall at the entrance of the river Liffey, exhibits one *fixed white* light at an elevation of 68 feet above high water, visible 12 miles. During foggy weather a bell is sounded.





bank in 6 fathoms; Dalkey tower in one with the Muglins, W. by S.  $\frac{1}{2}$  S., also leads southward of the bank in 7 fathoms; Lambay island nearly shutting on the Nose of Howth, leads within or westward of the bank.

**Rosbeg Bank**, of fine sand, 2 cables in diameter, with 16 to 18 feet water, is on the north side of Dublin bay,  $\frac{3}{4}$  of a mile from the shore of Howth; between the bank and shore is a blind channel with 4 to 6 fathoms water, known as Rosbeg channel; the bank is steep to the eastward.

**Buoy.**—A red can buoy marks the south-east side of this bank, with Kingstown east pier lighthouse, S.W. by W.  $\frac{1}{2}$  W.,  $3\frac{7}{10}$  miles; Poolbeg lighthouse, W. by N.  $\frac{1}{4}$  N.,  $3\frac{2}{10}$  miles; Sutton martello tower, in line with Sheep head point, N.N.W.; Howth Bailey lighthouse, N.E.  $\frac{3}{4}$  E., 8 cables; Burford North buoy, S.E.  $\frac{1}{2}$  S.,  $1\frac{6}{10}$  miles.

To clear Rosbeg bank on the east side, keep Piper head (the east extreme of Howth) open of the Bailey, or the Bailey light bearing N.E.  $\frac{1}{4}$  N. The hospital at the Pigeon house (the east house in the fort), a little open to the southward of Poolbeg lighthouse, or Poolbeg light bearing W.N.W., leads southward of the bank in  $3\frac{3}{4}$  fathoms; Baldoyle chapel kept on the west side of Warren house (a large white house west of Howth), bearing N.  $\frac{1}{2}$  W., leads westward of it in  $3\frac{1}{2}$  fathoms, and also leads up Sutton creek.

**Anchorage.**—Large vessels that from their great draught of water cannot enter Kingstown harbour, may anchor in Dublin bay, in fine weather, the east pier lighthouse bearing W.N.W. one mile distant, in 6 or 7 fathoms. The bottom, stiff marl with a covering of sand, affords capital holding-ground, but it is a very exposed anchorage, and vessels are recommended not to bring up here (except in cases of necessity) after the month of August or before April, and must be prepared to leave on the first appearance of a change of wind to the eastward.\*

**RIVER LIFFEY**,† which flows through the middle of the city of Dublin, is not navigable beyond Carlisle bridge. Commercial communication with the interior is, however, amply provided for by the Royal and Grand canals, which run from the north and south sides of the city. The former stretches in a westerly direction through Mullingar to Longford on the upper Shannon; the latter sends branches to the Shannon

\* The channel squadron anchored in the bay in 1863, when they had a hard gale from South to S.E. by S., and experienced much less sea than they expected, the ships holding on well with a good scope of cable. H.M.S. *Edgar*, the flag ship, could not purchase her anchor, which was broken in the attempt: a subsequent examination of the spot led to the finding of the keel and floor timbers of a vessel nearly buried, which the anchor probably fouled.

† See Admiralty plan of Dublin bar and river Liffey to Carlisle bridge, No. 1,447; scale,  $m = 14\cdot0$  inches.

and Ballinasloe in the west, and to the Barrow in the south. Railways radiate from the city to all the principal towns of the island.

The trade of Dublin is chiefly confined to the coasting or cross channel trade. In 1875, the arrivals were, coastwise, 7,058 vessels = 1,782,560 tons; foreign, 615 = 260,800 tons. Sailings, coastwise, 6,973 = 1,912,892 tons; foreign, 251 = 105,834 tons. The tonnage belonging to the port, consisted of 79 steam vessels, of 21,954 tons, and 452 sailing vessels of 36,370 tons. Population in 1871, 245,722.

Vice-consuls are resident for all the leading powers. Stores and supplies of all kinds are abundant, and there are facilities for repairs of every description. Water is supplied from mains laid on the quays. The charge is 8*d.* for the first 100 gallons and 4*d.* for every additional 100 gallons.

Dublin has several public hospitals, a sailor's home, and shipping office; the custom-house, a large and handsome building, stands on the quay on the north side of the river.

**North Wall Basin.**—An extensive tidal basin is now being formed on the north side of the river by the construction of a massive quay in continuation of the North wall to the eastward, and by other works, the depths in it at present vary from 14 to 23 feet.

Floating Docks:		Length.	Breadth.	Width of Ent.	Depth on sill L. W. Ord. sp.
George Dock, inner	-	600 ft.	270 ft.	—	—
Do. outer	-	320 „	230 „	36 ft.	4 ft. 5 in.
Old Dock	-	380 „	200 „	36 „	2 „ 5 „
Grand Canal, dock	-	700 „	300 „	—	—
Do. outer	-	1,580 „	360 „	35½ ft.	6 ft. 2 in.

Spencer dock, belonging to the Midland Railway Company of Ireland, has about one mile of quayage, 26 feet width of entrance, and a depth of 5 feet on the sill at low water.

**Graving Docks.**—North Wall graving dock, in North Wall basin, is 412 feet long on floor, with entrance 70½ feet in width, and has a depth of 5 feet 2 inches on sill at low-water. There are also three graving docks in connexion with the Grand Canal docks, which are capable of receiving vessels of from 50 to 600 tons register, but the length of the entrance chamber being only 144 feet, long vessels cannot get into the docks.

There are two patent slips in North Wall basin which will receive vessels of 200 and 450 tons register, and have, respectively, a depth on the carriage way of 8 feet and 10 feet at high water. A gridiron at Ringsend has a depth of 9 feet at high-water springs.

The power of the largest crane is 30 tons. The bye-laws of the port, with pilotage regulations, are published in a small pamphlet.

Dublin being at the head of a shallow sandy bay, which dries out for a distance of upwards of 2 miles from the shore, and the stream of the Liffey being quite inadequate to keep open a navigable channel to the sea, great difficulties were encountered, and immense sums of money expended, to bring the river into its present favourable condition. The necessity of having it improved, gave rise to the establishment of the Ballast Office ; and to an Act of Parliament passed in the 6th year of the reign of Queen Anne (1707) giving them power to cleanse the port of Dublin. From this period the works have been unremittingly carried on under the direction of the Ballast Board.

Between 1725 and 1735, an embankment was formed where the south wall now stands. Its beneficial effects were very apparent in the improved depth of water in the channel but as this structure was frequently out of repair, and did not sufficiently shelter the channel, it was resolved to substitute a wall in its stead, which was begun in 1761 by building Poolbeg lighthouse, and carried on from year to year until the whole was finished.

About midway on this wall, between the lighthouse and Ringsend, is Pigeon-house fort, used as a dépôt for artillery stores, and a small dry harbour. The North breakwater, or Bull wall, commenced in 1820, extends out from Clontarf on the north shore, and ends opposite Poolbeg lighthouse, leaving a passage into the river  $1\frac{1}{2}$  cables wide. Upwards of one-third of this wall is covered at high water. Its outer extremity is marked by a beacon, and by a *black* buoy half a cable southward of it.

**The bar**, which up to the year 1800 had not more than  $5\frac{1}{2}$  feet water, had, when examined in 1873, a depth of  $15\frac{1}{2}$  feet at low-water spring tides over a breadth of nearly two cables, it having increased  $2\frac{1}{2}$  feet in depth since 1856 ; and there was a depth of 12 feet and upwards over a breadth of four cables ; an improvement due to the continued use of the dredges and to the building of the North wall.

At low water the depths in the river vary from 15 to 24 feet abreast the quays, to 16 and 20 feet near the Pigeon-house, and from thence to Poolbeg there is a narrow channel with from 12 to 15 feet, but a vessel would not carry more than 10 or 11 feet in her passage between those places. There are several places where vessels may anchor in from 16 to 20 feet, and convenient quayage is provided at the city where ships drawing 22 feet can lie afloat at low water.

**Buoys.**—Three *black* buoys mark the north side of the channel over the bar, and one *red* buoy the south side of the channel. The north bar buoy, conical, *black*, in 14 feet, is one mile E. by S. from Poolbeg lighthouse. The middle buoy, a *black* can, in 13 feet, is W. by N.  $\frac{1}{4}$  N., nearly 4 cables from the north bar buoy. The inner buoy, a *black* can, is half a

cable S.S.E.  $\frac{1}{2}$  E. from the end of the north breakwater or Bull wall, which is also marked by a beacon near its extremity. All these *black* buoys must be left to the northward when crossing the bar.

South bar buoy, conical, *red*, in 12 feet water, is S.W. by W.  $\frac{1}{4}$  W.,  $6\frac{1}{2}$  cables from the north bar buoy, and S.E.  $\frac{1}{4}$  S. 7 cables from Poolbeg lighthouse.

The custom-house dome, or North wall lighthouse, just open to the north of Poolbeg lighthouse, N.W. by W.  $\frac{1}{2}$  W. (westerly), leads over the bar in the best water,  $15\frac{1}{2}$  feet, and nearly in mid-channel. St. George church in line with Poolbeg lighthouse, N.W. by W. (northerly), leads along the southern edge of the channel in 13 feet. Pigeon-house hospital, open south of Poolbeg lighthouse, W. by N.  $\frac{3}{4}$  N., leads in to the southward of the north bar buoy in  $15\frac{1}{2}$  feet water.

From Poolbeg lighthouse to near the North wall basin, the channel is marked by buoys, *black* to the northward, and *red* to the southward; there are also three stone towers and three perches on the north side of the channel.

From North wall lighthouse to Carlisle bridge the river is quayed on both sides.

**LIGHTS.**—A circular iron lighthouse, of a gray stone colour near the eastern extreme of the North wall, or quay, which is now in course of extension, and  $2\frac{1}{2}$  miles N.W. by W.  $\frac{1}{2}$  W. from Poolbeg lighthouse, shows a *fixed white* light at an elevation of 29 feet, visible in clear weather at the distance of 10 miles, and a sector of *red* light across the river to the southward. On the north side of the river, one quarter mile above the Pigeon-house, a small *white* light is exhibited on one of the perches.

**TIDES.**—It is high water, full and change, on Dublin bar, at 11h. 12m.; springs rise 12 to 14 feet, neaps 9 to 11 feet, but they are much influenced by prevailing winds, southerly gales causing high tides, while gales from the northward have a contrary effect.

The channel stream outside the bay runs N.N.E. and S.S.W. The flood stream from the southward sets in by Dalkey along the south shore, sweeping round the bay through Rosbeg channel to the Bailey, off which it rejoins the channel flood, a portion of it only flowing up the Liffey.

The ebb sets out on the south shore of the bay for a little more than 6 hours; but along the north shore there is nine hours stream to the north-east, that is, from half ebb till high water, and only three hours stream to the south-west, from high water till half ebb. Near the centre of the bay there is little or no tide.

**Directions.**—Vessels bound to Dublin bay from outside the banks, must always pass to the northward of Kish light-vessel; or in the event of her not being at her station, must bring Mapas obelisk open to the north-

ward of Dalkey tower, West, southerly (view B., chart 1,467), before standing into the bay. While passing the north end of Kish bank they will find 7 or 8 fathoms water, and immediately within it 10 or 12 fathoms.

From hence, a W. by N.  $\frac{3}{4}$  N. course for  $6\frac{1}{2}$  miles, will lead south of the south buoy of Burford bank to Kingstown harbour. Passing to the southward of Burford bank be careful to keep the custom-house dome well open to the southward of the Pigeon-house, N.W.  $\frac{1}{2}$  W. When standing in to the northward of the Burford with a ship of great draught of water, keep the custom-house dome well open north of Poolbeg lighthouse, N.W. by W.  $\frac{3}{4}$  W., which will lead two cables north of Burford north buoy, in 9 or 10 fathoms.

A vessel from the northward may boldly run for Kingstown harbour, giving the east shore of Howth a berth of from half a mile to one mile, and keeping Piper head open of the Bailey to avoid Rosbeg bank. By night, Kingstown east pier head light brought to bear W. by S.  $\frac{3}{4}$  S., will lead between Rosbeg and Burford banks. Vessels from the southward, by night, must not round into Dublin bay before Kingstown east pier light opens, bearing N.W.  $\frac{1}{2}$  N., in order to clear the Muglins. To enter Kingstown harbour attend to the directions given at p. 101.

To enter the Liffey the assistance of a pilot is desirable. Vessels waiting for tide may stand towards the head of the bay by the lead, or tack before the Mariners church at Kingstown comes in line with the east pier lighthouse, S.W.  $\frac{3}{4}$  S. To cross the bar in the best water,  $15\frac{1}{2}$  feet at low water, bring the custom-house dome, or North wall lighthouse, a little open to the north of Poolbeg lighthouse, N.W. by W.  $\frac{1}{2}$  W. (westerly), and run in with them in that direction. So soon as the bar has been passed the water will deepen. Keep about mid-channel between the lighthouse and the beacon which marks the outer end of the north breakwater, where is 26 to 30 feet water; the depth, however, quickly decreases to 16 and 14 feet. From hence steer towards the outer beacon tower, and when about half a mile within the lighthouse, a vessel may anchor in 15 or 16 feet at low water with the lighthouse bearing S.E.  $\frac{3}{4}$  E., and half a cable from the outer beacon tower. This is a good berth in summer, but in winter it is better to go farther up, and anchor off the Pigeon-house in 10 to 18 feet water, taking care to keep between the buoys that mark the channel, leaving the *black* buoys to the northward, and the *red* buoys to the southward. If desirous of going still farther up, anchor anywhere in the channel in 9 to 15 feet water, or run alongside the quay above Ringsend.

It is not customary for vessels to remain at anchor in the stream beyond a single tide, as their doing so would greatly obstruct the navigation.

Steam-vessels and colliers usually lie alongside the river quays, partly water-borne ; the North wall is appropriated to the former, and the south side to the colliers ; other vessels haul into one of the docks.

As the tide to the northward of Rosbeg bank runs to the eastward 9 hours, that is, during the last half of the ebb and the whole of the flood, vessels leaving the Liffey and bound northward should pass through Rosbeg channel, and when round the Bailey which is steep-to, haul up along shore towards the Nose of Howth.

Steam and small sailing vessels in moderate weather may safely pass through Dalkey sound by attending to the directions given at p. 99.

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## CHAPTER V.

## EAST COAST OF IRELAND.—DUBLIN BAY TO BELFAST LOUGH.

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VARIAION in 1877.

Carlingford cut,  $22^{\circ} 55' W.$ , decreasing 9 minutes annually.

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**HOWTH HARBOUR**,\* at nearly one mile to the north-west of the Nose of Howth, is formed by two piers run out from the shore towards Irelands Eye, with an entrance 100 yards wide, and enclosing an area of 50 acres. Nearly two-thirds of this space, consisting of a broken rocky shore, is uncovered at low water. The harbour was commenced in 1807, and was intended for a packet station, but it will not accommodate the class of vessels that are now employed on this service. It is, however, of great importance as a fishing station.

Foul ground extends from the back of the eastern pier to the distance of half a cable. The lighthouse kept on a bearing to the southward of  $W. \frac{1}{4} S.$  clears it. One cable within the entrance, and at the distance of half a cable from the western pier, Murr rock uncovers at low water, and from this to the eastward a broken rocky foreshore extends quite across the harbour. Along the western pier the bottom is clean, and in the west corner of the harbour is a clean sandy beach, the only spot where vessels can take the ground with safety. With easterly gales a very heavy sea breaks across the entrance, but when once within the pier heads perfect shelter is obtained.

The village of Howth is chiefly inhabited by fishermen. Excellent water may be obtained from a stream that flows beneath Mary abbey, a conspicuous ruin, near the eastern pier. The customs and harbour-master's offices are on the outer end of the western pier, and the railway station is near its inner end.

Baldoyle creek, to the westward of Howth harbour, is fit only for small craft. The channel between Baldoyle spit and the shore is narrow and crooked, and almost dries in some parts. Vessels bound here should stop at Howth until the wind is favourable.

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\* See Admiralty chart :—Ireland, east coast, Howth to Drogheda, No. 2,834 ; scale,  $m = 1.7$  inches. Also, Dublin to Carlingford, sheet I., No. 1,468 ; scale,  $m = 0.5$  inch.



**LIGHT.**—The lighthouse, on the eastern pier head, exhibits a *fixed red* light, at an elevation of 43 feet, visible at the distance of 11 miles in clear weather.

**Life-boat.**—A life-boat is stationed at Howth.

**IRELANDS EYE**, a small rocky island about one mile to the northward of the Nose of Howth, rises abruptly on its north side to the height of 339 feet, and slopes down to its southern extreme; from whence shelving rocks, which cover at high water only, extend to the Thulla, a small patch elevated several feet above high water, south and south-west of which are some rocky patches called the Rowans, which uncover to a distance of 2 cables. Howth church kept open to the southward of the lighthouse, W. by S., clears the Rowans.

At the distance of half a cable from the north-west point of Irelands Eye is a patch of rock which dries 6 feet, and  $1\frac{1}{4}$  cables from the south-east point is Flat rock, otherwise to the northward and eastward the island is steep-to, with 5 and 6 fathoms water at half a cable's distance from the rocks; but to the westward it is very shallow, there not being more than 12 feet water in the middle of Howth sound, which at low water is about one-third of a mile wide, the depths decreasing towards each side.

There is good anchorage with off-shore winds, off the north-west end of Irelands Eye, in from 4 to 6 fathoms water; with the Nose of Howth and the martello tower on Irelands Eye in line.

**TIDES.**—It is high water, full and change, at Howth, at 11h. 9m.; springs rise 13 feet, neaps 10 feet.

The ebb tide from Baldoyle creek sets close along the west pier, and across the harbour's mouth, catching the east pier head, and whirling round in the entrance, where it deposits the matter it brings down. In the sound between Irelands Eye and the main, the stream turns  $1\frac{1}{2}$  hours sooner than in the offing, and runs at the rate of 2 knots an hour. In Balcaddan bay there is an eddy setting to the eastward during nearly the whole of the flood. To the eastward of Irelands Eye, and extending to  $1\frac{1}{2}$  cables distance from the rocks the stream runs 9 hours to the northward.

**Directions.**—Approaching Howth harbour from the eastward, care must be taken to avoid the rocks to the southward of Irelands Eye. From the northward, the martello tower on the little hill near the east pier, kept between the pier heads, S.  $\frac{1}{2}$  W., will lead between Irelands Eye and the main in from 10 to 12 feet water. On approaching the entrance, keep to the eastward of this line, to avoid Baldoyle spit, which is extending itself across the entrance. At night, keep the light between S.  $\frac{3}{4}$  E. and S.  $\frac{1}{4}$  W.

In moderate gales from the eastward vessels may run for Howth at half flood, in very bad weather they must wait until near high water. Vessels caught to the northward of Howth in south-westerly or westerly gales, find it convenient to make for that harbour instead of beating across Dublin bay to Kingstown, these winds blowing very heavy out of the bay.

**The COAST** from Howth to Rush point, 8 miles to the northward, is of moderate elevation, and is generally fronted by a clean sandy beach, which may be approached by the lead. Between are the shallow inlets of Malahide and Rogerstown, with Lambay island nearly in front of the latter.

**MALAHIDE INLET\*** has a shifting bar with not more than 2 feet over it at low water. At the period of the last survey, in 1852, there were two channels over the bar, of which the south was considered the best; it is marked by a small buoy on the tail of Round bank, which must be left to the southward when entering the inlet.

Within the bar the channel runs along the south shore and is scarcely half a cable in width, with from 10 to 16 feet water. The railway is carried across the inlet by long embankments and a bridge close to the westward of the town.

The north end of Malahide chapel, opening north of the hotel (view E., chart 2,834), leads over the bar through the south channel, until Swords church comes in line with a single tree to the northward of Malahide, which will lead up to abreast the town. When Malahide church comes in line with St. James terrace, a vessel may anchor in 14 or 15 feet at low water. The martello tower at Rush kept open of Cable rock, N.E.  $\frac{3}{4}$  N., leads eastward of the bar, but rather close to it. Strangers should not enter the inlet without a pilot, who will come off on the signal being made.

**ROGERSTOWN INLET\*** has a bar that nearly dries at low water; within it, a narrow channel, with 6 to 8 feet water, leads between the sands to a quay on the north shore.

The entrance, as at Malahide, is divided into two channels by a shingle bank with only 7 feet over it at high water. A single tree on with the south side of the store near the quay leads over this bank, and up through the channel towards the quay. To cross the bar in the best water, which varies with every gale, the assistance of a local pilot is necessary. Shelmartin hill in one with Cable rock, S.W. by W. (view D., chart 2,834), leads eastward of Rogerstown bar.

**Life-boat.**—A life-boat is stationed at Rogerstown.

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\* See plans of Malahide and Rogerstown inlets, on Admiralty chart, Ireland, east coast, Howth to Drogheda, No. 2,834.

The harbour which is formed by a quay extending from the north-west end of Red island, and sheltered by Cross rock ledge, has from 12 to 13 feet within it at high-water springs, and 8 to 10 feet on neaps, but it is completely dry at low water. The beach, composed of hard fine gravel, is level, and favourable for vessels lying on their legs, when from its usually crowded state there is not room for them alongside the quay. There is little or no inrun, and it is considered the best dry harbour on the coast.

The town is of considerable extent. Its inhabitants are chiefly employed in the fishing and coasting trade. The railway to Dublin, 15 miles distant, passes within half a mile of the town.

**Life-boat.**—A life-boat is stationed at Skerries.

**ROCKABILL** is E.  $\frac{3}{4}$  S.  $2\frac{1}{2}$  miles from St. Patrick island, and, although separated from the Skerries by a deep and clear channel, may be considered an outlier of the group. It consists of two granite rocks rising abruptly from the sea to a height of 30 feet, with a lighthouse on the highest part. The rocks are clear of danger, with 7 or 8 fathoms close to them, and 9 to 14 fathoms at the distance of one quarter of a mile. Between them and St. Patrick island there are from 12 to 14 fathoms water.

**LIGHT.**—The lighthouse, erected on the summit of the larger Rockabill rock, is a circular tower of gray limestone, 105 feet high from its base to the top of the lantern, and exhibits, at an elevation of 148 feet above high water, a *flashing* light *every twelve seconds*, visible at the distance of 18 miles, *white* from between the bearings N.  $\frac{3}{4}$  W. (round westward) to S.S.W.  $\frac{7}{8}$  W., and *red* when viewed from the westward or landward side between the same bearings. A range of storehouses surrounds the lower story of the tower. The dwelling houses are built to the north-westward on a lower level of the rock, the whole forming a very conspicuous sea-mark, and a most useful guide by night and by day to the numerous vessels passing along this part of the coast.

Large vessels working up or down channel at night must not open the red light.

**TIDES.**—It is high water, full and change, at Skerries, at 11 h. 0 m.; springs rise 13 feet, neaps 10 feet.

In the sound between the islands, both streams turn about one hour earlier than in the offing. Outside St. Patrick island, and to the southward as far as lough Shinny, the ebb stream makes to the southward one hour earlier than in the offing, and runs from 7 to  $7\frac{1}{2}$  hours, or from 1 to  $1\frac{1}{2}$  hours after the flood has made in the offing. It then turns to the northward, following the direction of the coast. Its maximum rate is  $1\frac{1}{2}$  knots.

**Directions.**—Approaching the harbour from outside the islands, do not come within one-third of a mile of the east end of St. Patrick, in order to avoid Big rock. From the southward, with the wind westerly, a small vessel may pass through the sound between Colt island and St. Patrick island. To do so, keep Hampton hall open southward of the houses on Red island (view B., chart 2,834), until Popes hall hill appears in line with Shenick tower, bearing S.S.W.  $\frac{3}{4}$  W. (view A.), which will lead through the sound. The ruins on St. Patrick island kept open northward of Colt island, until Popes hall hill opens of the pier head, clears Cross rocks (view C.). To wait for tide to run in to the quay, vessels may anchor in the bay, with the east houses of the town open of the quay, at the distance of one quarter to half a mile from the quay head, in from 3 to 4 fathoms, and be quite sheltered in westerly and southerly winds, but exposed to those from east and north-east.

**The COAST** northward of the Skerries is of moderate elevation, and must be approached with caution, as it runs flat a long way off, and has several outlying dangers. A large ship should not approach it into a less depth than 10 fathoms in fine weather, or 25 fathoms in hazy weather.

**BALBRIGGAN**, 3 miles northward of Skerries, has a small pier harbour, dry at low water, built in 1761, and subsequently improved and strengthened. The pier is on a ledge of rocks, which uncover at low water to a cable outside the pier head; and extending from the point under the martello tower on the north side of the harbour is another ledge of rocks, with a clean sandy beach between it and the pier favourable for vessels running aground. At high-water spring tides there is 12 and 13 feet water close to the inner side of the pier. A jetty projecting from the shore parallel to the inner part of the pier, affords additional shelter to small vessels, by breaking the heavy run which sets into the harbour with southerly winds.

**Life-boat.**—A life-boat is stationed at Balbriggan.

The town, celebrated for its manufacture of hosiery, had, in 1871, a population of 2,258. The railway to Dublin passes through it, and across the head of the harbour.

**LIGHT.**—A circular white tower on the head of the pier exhibits, at an elevation of 42 feet, a *fixed white* light, visible at the distance of 10 miles in clear weather. A sector of *red* light shown between the bearings N.N.W.  $\frac{3}{4}$  W. and N.W. covers the Skerries.

To proceed into Balbriggan harbour it is necessary to wait until near high water. The lighthouse must not be approached nearer than  $1\frac{1}{2}$  cables until it bears S.W.  $\frac{3}{4}$  W., when a vessel may run in, keeping close to

the pier head, where the deepest water will be found, and make fast alongside of the pier.

**TIDES.**—It is high water, full and change, at Balbriggan, at 10h. 40m., springs rise 13 feet.

**CARDY ROCKS**, a patch of half-tide rocks, marked by an iron perch, are one mile N.N.E. of Balbriggan lighthouse, and 4 cables from Braymore point, with a narrow passage of 3 fathoms water between them and the latter. To clear them, Balbriggan lighthouse must not be brought to the southward of S.W.  $\frac{1}{4}$  S.

**RIVER BOYNE\*** is the first important inlet northward of the Skerries. The entrance,  $6\frac{1}{4}$  miles to the northward of Balbriggan, and 9 miles northward of the Skerries, is well marked by wooden perches and stone beacons; also by Maiden tower, with a small obelisk beside it called the Thumb, and four lighthouses on iron framings on the sand-hills near them. The entering channel, confined between sea walls, crosses the sandy foreshore in a N.W. by W.  $\frac{1}{4}$  W. direction towards Maiden tower, and then takes the direction of the shore, N.  $\frac{3}{4}$  W., to Crook point, one mile distant from the bar, where the river is fairly entered. Conspicuous stone beacons, standing near the margin of low water, mark the eastern side of the channel up to Crook point; the south and west sides are marked by wooden perches. The width between the walls at the entrance is about 280 yards, which decreases to 186 yards abreast Maiden tower.

Between Crook point and Drogheda, the channel is confined between low guide walls that overflow at half-tide, when its direction is marked by stone beacons standing on the walls. At low water there is a depth of from 4 to 5 feet water on the bar, and from 6 to 9 feet in the river, gained by the continued use of the dredge.

A little below Drogheda a railway viaduct, 95 feet high, crosses the river, permitting vessels to pass freely up to the quays. Vessels lie alongside the quays, afloat or water-borne.

The improvements in the Boyne were begun in 1782. Spur walls and jetties to direct the scour were subsequently erected. To these were added longitudinal dykes, or guiding walls.

Drogheda, situated on the Boyne about 4 miles from the sea, has several flax mills, and iron works, where steam engines, boilers, &c., are manufactured; also a ship-building yard, and patent slip capable of receiving vessels of 200 tons. The exports are principally agricultural produce, provisions, and linen. In 1875 the arrivals were, coastwise, 779 vessels = 135,830 tons; foreign, 4 = 1,278 tons: and the sailings were, coastwise,

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\* See Admiralty chart, Ireland, east coast, Drogheda to Carlingford, No. 44; scale,  $m = 1.65$  inches; also plan of Drogheda entrance on same chart.

793 vessels = 138,073 tons; foreign, 2 = 708 tons. The tonnage belonging to the port consisted of 35 sailing vessels, of 3,173 tons, and 6 steam-vessels, of 1,798 tons. Population in 1871, 14,740. Supplies of all kinds may be procured.

**Pilots** are always on the look-out at Skerries and Clogher head. The rates vary from 6s. for a coasting vessel of 40 tons, to 40s. for one of 400 tons. Foreigners pay double rates, and British vessels from foreign, a rate and a half. A steam tug is in attendance.

**Life-boat.**—A life-boat is stationed at Drogheda.

**LIGHTS.**—Four lighthouses, on iron frame-work, stand on the sand-hills on the south side of the entrance to Boyne river, from three of which only lights are exhibited.

**East Light.**—The east lighthouse exhibits, at an elevation of 27 feet above high water, a *fixed white* light, visible from seaward between W.  $\frac{1}{2}$  S. and N.W. by W.  $\frac{1}{2}$  W., and bears from Rockabill N.N.W.  $\frac{1}{4}$  W.,  $11\frac{1}{2}$  miles distant.

**West Light.**—The west light, with an elevation of 40 feet above high water, is also a *fixed white* light, open from seaward between W.  $\frac{1}{2}$  S. and N.W. by W.  $\frac{1}{2}$  W., and bears from the east light W. by N., 100 yards distant. These lights in line lead across the bar, and their positions will be occasionally changed, as alterations in the bar may take place.

**North Light.**—The north light, with an elevation of 23 feet above high water, is a *fixed red* light, open to the channel from within the bar. It bears from the east lighthouse N. by W.  $\frac{3}{8}$  W., 780 yards distant.

There are five *white* lights and one *green* light in the inner portion of the channel to Drogheda.

**TIDES.**—It is high water, full and change,—

	h. m.			ft. in.			ft. in.			
At the Bar at -	11	0	-	springs rise	11	9	-	neaps rise	9	0
„ Drogheda -	11	45	-	„	11	3	-	„	9	3
„ Canal lock -	11	50	-	„	5	9	-	„	—	—

The tide flows as far as Oldbridge,  $2\frac{1}{4}$  miles above Drogheda, from whence the Boyne navigation, for barges of 50 tons, extends inland to Navan, 19 miles distant.

**Directions.**—To sail into the Boyne, take the last quarter flood. The east and west lights in line bearing W. by N. will lead over the bar in the best water. By day, keep in mid-channel between the perches and beacons; by night, haul up for the *red* light as soon as it opens, and it will lead into safety. Ships drawing  $10\frac{1}{2}$  feet water should have at least 4 hours flood before they take the bar. A pilot is necessary for going up to Drogheda.

**CLOGHER HEAD**, at  $4\frac{1}{2}$  miles N.E.  $\frac{1}{2}$  N. from Maiden tower, is a bold rocky promontory, on which is a fishing village. It is moderately bold-to and clear of danger, there being  $3\frac{1}{2}$  and 4 fathoms water within 2 cables distance. On its north side is port Oriel, a small cove dry at low water, and subjected to a good deal of swell in bad weather.

Dunany point, of moderate height, with a church on the summit of the rising ground over it, is 4 miles northward of Clogher head, and forms the southern limit of Dundalk bay.

**DUNDALK BAY**, between Dunany point and Cooley point, is foul and shallow throughout. Extensive reefs project from both points of entrance, and midway between them are patches of 4 to  $4\frac{1}{2}$  fathoms.\*

The southern and western parts of the bay are also very shallow and rocky, with not more than 2 to 3 fathoms water over a large space. Towards the north shore, and  $1\frac{1}{2}$  miles westward of Cooley point, the bottom is clean sand, and the soundings decrease gradually to the head of the bay, affording tolerable anchorage with off-shore winds, where vessels waiting for tide to proceed up to Dundalk may anchor. The best place for this purpose is off Giles quay, in from 2 to 5 fathoms, fine sand, Giles pillar bearing from North to N.E. by E.  $\frac{3}{4}$  E., Dundalk lighthouse from N.W.  $\frac{1}{4}$  N. to N.N.W.  $\frac{3}{4}$  W., from half a mile to  $1\frac{1}{2}$  miles off shore.

From Giles quay extensive sand-banks sweep round the bight of the bay to beyond Anagassan on the south shore, uncovering at low water for a distance of upwards of 2 miles from the high-water limit. A narrow channel leads through these sands to the dry harbour of Dundalk.

**Dunany Reefs** extend off north-eastward from Dunany point in irregular patches, for  $2\frac{1}{2}$  miles; at which distance there is not more than 13 feet at low water, with patches of 8 to 11 feet between it and the shore.

A red buoy with staff and ball is placed about 4 cables eastward of the 13-feet patch, in 5 fathoms water, with Carlingford lighthouse, in line with Slieve Donard, N.E.  $\frac{3}{4}$  E.; Ballymakerry church steeple in line with Dunany point, S.W. by W.  $\frac{1}{4}$  W.; and Tippings hill, in line with the right shoulder of Slieve Gullion, N.  $\frac{1}{2}$  W. This latter mark (view, chart 44) leads eastward of the reefs in 21 feet water, and to abreast the outer fairway buoy to Dundalk. The high land of Balbriggan open of Clogher head, S.S.W.  $\frac{3}{4}$  W. westerly, leads close to the south-east side of the reefs. The bottom continues foul, with patches of  $3\frac{1}{2}$  fathoms water, for  $1\frac{1}{2}$  mile to the eastward of the buoy. The outermost of these, called Dundalk patch, is  $3\frac{1}{2}$  miles E.N.E. from Dunany point.

Persons acquainted with the place may pass between the shoals and

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\* See Admiralty chart, Ireland, east coast, Drogheda to Carlingford, No. 44; scale, m = 1.65 inches.

Dunany point in 13 feet at low water; but as the point is fronted by out-lying rocks, one of which, at the distance of half a mile to the eastward of it, uncovers at low water, and there being no leading marks for the channel, strangers should on no account go within the buoy.

**Castle Rocks.**—Two beds of rocks extend from the shore in the vicinity of Cooley point. The westernmost of these, called Castle rocks, projects in a S. by W.  $\frac{3}{4}$  W. direction from the west side of the point, with but 7 feet water at the distance of one mile from the shore.

**Imogene Rock.**—On the other shoal, named the Ridge, which extends off nearly 2 miles from Cooley point, is a pinnacle rock with 3 feet water, called the Imogene, from which Cooley point bears N.N.W.  $\frac{8}{10}$  mile distant. The Ridge has from 7 to 10 feet over it, the shoalest portion being one-third mile east of the Imogene, and between it and Ballagan point the bottom is very irregular.

The lightkeepers' houses on Cranfield point, in line with a gap in Mourne mountains, N.E.  $\frac{1}{2}$  N., leads south-eastward of the Ridge; and a distant mountain at the head of Dundalk bay, open of the foot of Carlingford mountains, N.W. by N., clears Castle rocks. On this line of bearing Tippings hill is just shut in.

To assist vessels in keeping to the southward of these shoals, a *black* conical buoy, marked "Imogene rocks," has been placed in  $7\frac{1}{2}$  fathoms water, with Cooley point N.  $\frac{3}{4}$  W.  $1\frac{3}{4}$  miles distant, Hellyhunter bell buoy, N.E. by E.  $\frac{3}{4}$  E., and the north-east end of Rathcor village touching Templeton point, N.W.  $\frac{3}{4}$  N. Imogene rock is nearly half-way between the buoy and the shore. Vessels must always pass to the southward of the buoy.

**LIGHT.**—The eastern side of the entrance to Dundalk harbour is marked by a pile lighthouse which exhibits, at an elevation of 33 feet above high water, a *flashing* light at intervals of *fifteen seconds*, visible at the distance of 9 miles.

The light shows *white* to seaward, when bearing between W.  $\frac{1}{4}$  S. and N. by W.  $\frac{1}{4}$  W.; it is *masked* to cover Dunany reefs between N. by W.  $\frac{1}{4}$  W. and N. by E.  $\frac{1}{8}$  E.; it shows *red* over the south-west banks between N. by E.  $\frac{1}{8}$  E. and S.S.E.  $\frac{3}{4}$  E.; it is *white* in the direction of the channel to Dundalk, when bearing between S.S.E.  $\frac{3}{4}$  E. and S.  $\frac{1}{2}$  E., and it is *masked* over the north-east sand-banks between S.  $\frac{1}{2}$  E. and W.  $\frac{1}{4}$  S.

A bell strikes six times per minute in foggy weather.

**Dundalk Harbour.**—The approach to the harbour is further marked by three *black* buoys. From the outer buoy, in  $5\frac{1}{2}$  fathoms, the lighthouse bears N. by W.  $\frac{1}{2}$  W.  $2\frac{3}{4}$  miles distant. The middle buoy is on the same line of bearing  $1\frac{1}{4}$  miles from the lighthouse. Both these buoys



should be left to the westward. The inner buoy is on the bar, and must be kept on the starboard hand in entering.

The bar, an extensive sandy flat, which is stated to have about 3 to 4 feet water on it at low water springs, and at high water springs from 18 to 19 feet, extends to half a mile outside the lighthouse. The channel over it, which was formerly subject to much variation in direction, has been permanently fixed, and otherwise improved, by the construction of a submerged wall which extends from the lighthouse inwards on the east side of the channel for about  $1\frac{3}{4}$  miles, and seaward for about 100 yards. A parallel submerged wall is also being formed on the west side of the channel.\*

The channel from the lighthouse towards Dundalk is marked by eight hexagonal beacons constructed of timber piles, *red* on the starboard hand and *black* on the port hand entering, they are furnished with lamps, which are lighted every night at tide-time, as also are several perch beacons, but the number of the latter varies according to circumstances. The general direction of the channel from the lighthouse to Rock beacon is N.  $\frac{3}{4}$  W. 2 miles, and from thence about three-quarters of a mile farther to Soldiers point. Close to the southward of Rock beacon, there is a small gully called Rock hole, with 20 feet water, where moorings are laid down, and small vessels may wait for tide. They may also lie safely on the ground in any part of the channel within the lighthouse.

From Soldiers point to the town, the south side of the harbour is embanked; in front of the town it is quayed. The channel, about 200 feet wide, and with from 3 to 4 feet water, runs close along the embankment to the quays, and is marked by perches to the northward. Vessels lie alongside of the quays partly water-borne.

**Dundalk**, a town of considerable size, carries on a brisk trade, chiefly in grain, cattle, butter, and eggs. Steamers run regularly to Liverpool. The arrivals in 1873 were 852 vessels, of 149,463 tons, of which 247 were steam-vessels. There were 38 sailing vessels belonging to the port, of 3,374 tons, and 7 steam-vessels of 1,857 tons. Population in 1871, 10,360. The town enjoys extensive railway communication with all parts of Ireland. Supplies of all kinds are abundant.

**Pilots** may always be obtained from Giles quay, by vessels hoisting the usual signal as soon as they have opened the bay. A steam-tug is in attendance at tide time. Vessels requiring her assistance should show by day, an ensign at the fore top-gallant mast head; by night, two lights, one above the other.

**Life-boat.**—A life-boat is stationed at Dundalk.

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\* The improvement works, which were begun in 1864, are still in progress.

**TIDES.**—It is high water, full and change, at Dundalk lighthouse, at 10h. 56m.; springs rise 15 feet, neaps  $11\frac{1}{2}$  feet. At Soldiers point the rise on springs is  $11\frac{1}{4}$  feet, and at the quays 11 feet.

**Directions.**—Vessels of a large class should on no account enter Dundalk bay, or stand towards it into less than 12 or 14 fathoms water.

Small vessels from the southward bound to Dundalk must be careful to avoid Dunany reefs. By day, keep Clogher head S.S.W.  $\frac{1}{4}$  W., westerly, with the high land near Balbriggan open, until Tippings hill comes in line with the right shoulder of Slieve Gullion, N.  $\frac{1}{2}$  W. (view chart 44). By night, do not decrease the depth to less than 10 or 11 fathoms until Dundalk light opens; by keeping it in view a vessel will clear Dunany reefs and also the foul ground on the south-west side of the bay. Leave the *red* buoy on Dunany reefs as well as the fairway *black* buoys to the westward; and if the tide does not suit for going up to Dundalk, or if in want of a pilot, anchor off Giles quay (see page 118).

Vessels from the eastward must keep a distant hill at the head of Dundalk bay open of the foot of Carlingford mountain, N.W. by N., with Tippings hill just shut in, in order to clear the foul ground off Cooley point.

Vessels obliged to enter the harbour without a pilot, should endeavour to keep an offing until near high water; and after passing the lighthouse, they must keep the *black* beacons, and perches with *black* ball on top, on the port hand, and the *red* beacons, and perches carrying a *red* cone, on the starboard hand.

Masters of vessels are cautioned to give the beacons and perches a sufficient berth.

**LOUGH CARLINGFORD\*** has depth sufficient for the largest ships, and, in accordance with a recommendation of the Royal Commissioners on Harbours of Refuge (1859), a channel, 400 feet wide, with a depth of 15 feet at low water spring tides, has been cut through the bar at its entrance, which had formerly only 8 feet over it; the bottom, however, is very rough, and is probably strewn with loose boulders. Two leading lights mark the direction of the cut, and its sides are buoyed with *black* buoys on the port hand, and *red* buoys on the starboard hand, entering; the two outer buoys, marked Carlingford Bar, No. 1 (*black*) and No. 2 (*red*), lying, respectively, in 4 fathoms, and  $3\frac{1}{4}$  fathoms, at low-water springs; and the inner buoys, marked C. Bar, No. 3 (*black*), and No. 4 (*red*), in 10 feet at low water. The *red* bell buoy on Hellyhunter rock must be left on the starboard hand in entering. There is also a

\* See Admiralty plan of entrance to lough Carlingford, No. 2,810; scale,  $m = 7$  inches: also, lough Carlingford, No. 2,800, scale,  $m = 3\cdot5$  inches: also, plan on chart of Irish channel, sheet 2, No. 1,825b.

narrow channel round the west end of the bar shoals, with 18 feet at low water, but it is too circuitous to be generally useful.

The land about the entrance is low, but the upper part of the lough is surrounded by mountains of from 1,000 to 2,000 feet elevation, which subjects it to sudden gusts of wind, especially when it is blowing hard between West and N.W.

The lough is much encumbered with dangers, rendering the navigation at low water very intricate ; but just within the entrance is a clear open space affording secure anchorage to the largest vessels.

Above Greenore point the channel runs between two rocky shoals, called Watson and Stalka rocks, for about half a mile, and above these continues through the middle of the lough in a N.N.W.  $\frac{1}{2}$  W. direction for about 3 miles farther, maintaining an average width of about  $3\frac{1}{2}$  cables, and is bounded by extensive sand-banks which line both shores. A short distance above Killowen point the deep channel terminates, and is succeeded by a broad expanse of shallow water that occupies the whole head of the lough to Warren point, with scarcely a foot difference of depth across from shore to shore. Between Stalka and Watson rocks there is not more than from  $3\frac{1}{2}$  to 4 fathoms water ; in other parts of the channel there is from 6 to 8 fathoms, excepting in one place off Ballyedmond, where is a hole with 20 fathoms. In Rostrevor bay there is from 8 to 10 feet, shoaling to 5 and 6 feet off Warren point, the whole affording excellent anchorage, with perfect shelter from all winds and sea.

There is no town of any importance on the shores of lough Carlingford ; but it is the port of Newry, a town of great commercial activity, 6 miles above Warren point, which enjoys water communication with the lough by means of an intricate river navigation for  $2\frac{1}{2}$  miles, and then a ship canal  $3\frac{1}{2}$  miles long. It has also a railway to Warren point, where vessels of large burthen discharge part of their cargo before going up to Newry.

Great pains have been taken to deepen the river between Warren point and Victoria lock at the entrance of the ship canal, but it may still be described as shallow and intricate. In many parts it does not carry more than from 2 to 3 feet water, but about one-third of a mile southward of the lock there is a remarkable depression called Doyles hole, in which there is 70 feet water. From Victoria lock to Newry the bed of the river is almost dry at low water.

Victoria lock is 200 feet long and 50 feet wide, and there is 14 feet water in the canal. Vessels whose dimensions do not exceed these measurements, may proceed through it to Albert basin, Newry. The dues are 1s. per ton inwards, and 1d. per ton outwards. Barges ply by the Newry canal navigation to lough Neagh, 32 miles distant.

Newry contains several corn and flour mills, with iron and brass foundries. The manufactures are linen, yarn, cotton, salt, and cordage. The principal exports are grain, provisions, cattle, eggs, flax, linens, and butter. In 1875, the returns from the custom-house were : arrivals, coastwise, 1,562 vessels = 279,841 tons ; foreign, 114 vessels = 37,157 tons. Sailings, coastwise, 1,463 vessels = 286,006 tons ; foreign, 35 = 15,526 tons. There belonged to the port 56 sailing vessels, of 2,459 tons, and 5 steam vessels, of 455 tons. Population in 1871, 12,179. The Belfast junction railway passes within a mile of the town, and the Newry and Armagh railway runs through it to Warren point.

**Supplies** may be readily obtained by vessels frequenting the lough from Newry, and water from a spring about one mile northward of the village of Carlingford. There is a patent slip at Warren point capable of receiving vessels of 750 tons.

**Pilots** may be had at Cranfield point, and also at Derryogue, 2 miles to the eastward. They will board outside the bar in moderate weather, on the usual signal being made. The rates as far as Warren point, are, for foreigners 3*s.* per foot ; British vessels from foreign 2*s.* per foot ; coasters 10*d.* per foot. Dutch vessels are charged only as British. A steam tug may be procured at Warren point.

**LIGHTS.**—**Haulbowline Lighthouse**, on a rock, which covers at first quarter flood, at the west side of the entrance to lough Carlingford, 111 feet from base to vane, and painted white, exhibits at 104 feet above high water a *fixed white* light, visible at the distance of 15 miles ; a second *white* light is shown half-way up the tower from half-flood to half-ebb, and a ball is hoisted by day during the same period. A *red* light is shown from a window on the third floor between the bearings S.W.  $\frac{1}{2}$  W. and S.W.  $\frac{1}{2}$  S., to indicate the turning point in the channel. In foggy weather a bell is sounded every half minute.

**Leading Lights** for the channel through the bar :—Two screw-pile lighthouses are placed on the outer margin of the bank between Soldier's point and Green Castle point, they bear from each other N.N.W.  $\frac{1}{4}$  W. and S.S.E.  $\frac{1}{4}$  E., 500 yards apart, and both exhibit *fixed white* lights, the outer 23 feet above high water, visible 5 miles ; the inner 40 feet above high water, visible 6 miles. These lights are obscured when bearing eastward of N.E. by E.  $\frac{3}{4}$  E.

**Greenore Lighthouse** on the south side of the point exhibits at 29 feet above high water a *revolving white* light every *forty-five seconds*, visible 9 miles ; this light is obscured when bearing east of S.  $\frac{1}{4}$  E. by the new buildings on the point.

**Greenore Pier Light**, N.  $\frac{1}{2}$  E., 100 yards from Greenore light, is a *fixed red* gas light, 33 feet above high water, and should be visible 5 miles ;

when in line with Greenore light it leads between Watson and Stalka rocks.

**Hellyhunter Rock**, with 5 feet water, is on the outer portion of the foul ground extending from Cranfield point, distant one mile S.E.  $\frac{1}{4}$  S. from the point. A *red* bell buoy is moored in 4 fathoms water S.S.W.  $\frac{1}{2}$  W.  $3\frac{1}{2}$  cables from the rock. Haulbowline and Greenore lights in line, N.W. northerly, leads close to the westward of the buoy, and up to the entrance of Carlingford cut.

**The Bar.**—Shoals, composed of sand and clay, with large stones, extend from Cranfield point more than one mile in a south-westerly direction, with a breadth of half a mile between the three fathoms limits. Morgan pladdy, a rocky eminence, 6 cables from the point, has but 5 feet water, and the Breast, near their south-west extreme, 7 feet. As already remarked, a channel, having a depth of 15 feet at low water spring tides, has been cut through the bar.

**Limestone Rocks.**—Ballagan point is surrounded with foul ground. A little within it a reef of limestone rocks extends across the entrance to Haulbowline lighthouse; some of these uncover at half ebb, and others at low water, forming a natural breakwater to the anchorage within them.

Between Limestone rocks and the bar, is Hoskyn channel, 200 yards wide at its narrowest part, with 18 feet at low water, but in the total absence of buoys and beacons it is not available for navigation.

Haulbowline lighthouse is surrounded by rocky prongs. N.E. by N. nearly one cable from it, is a rock dry at low water; No. 5 *black* buoy is placed outside it in 7 feet water.

To the north-westward of the lighthouse, Blockhouse island, an extensive rocky flat, with a ruined house on it, is nearly covered at high water; its eastern shore is steep to. Within this, on the inner edge of Limestone rocks, Sheep rock, marked by an iron perch, uncovers on last quarter ebb. From hence to Greenore point the western shore of the lough is fronted by extensive flats, which uncover at low water, and are steep-to, as is also Greenore point. When Greencastle has been brought northward of Green island, a vessel may stand towards this shore until Newry mountain touches Greenore point, bearing N.N.W.  $\frac{1}{2}$  W.; but to the southward of that line the mountain must be kept well open of Greenore point.

**The Scars**, a gravelly bank in front of Cranfield bay, dry at low water, and steep-to, is the first danger within the entrance on the east shore. A *red* buoy is placed near its south end in 8 feet water. As the flood tide sets into Cranfield bay, vessels entering the lough in light winds, must be careful to avoid being set on the Scars. The foot of Carlingford

mountain touching the west side of Green island is the pilot's mark for clearing it, but this mark is too ill-defined to be of use to a stranger. From Soldiers point towards Green island, the shore is covered by a mud flat, which dries for about one-third of a mile off, and is steep-to.

**New England Rock**, with  $10\frac{1}{2}$  feet water, and marked by a bell-buoy, is in the channel between the Scars and Blockhouse island, with the Blockhouse bearing S.W.  $\frac{1}{4}$  S., and Slieve Binian between two white houses on Soldiers point, N.E.  $\frac{1}{2}$  E. The channel is between the rock and Blockhouse island, and is 200 yards wide, with 8 to 13 fathoms water.

**Vidal Rock**, with 7 feet water, is  $3\frac{1}{2}$  cables north-westward of New England rock, with the Blockhouse bearing S. by E., and the perch on Sheep rock, S.W. by W.  $\frac{1}{2}$  W.,  $3\frac{1}{2}$  cables distant; a *red* buoy lies to the westward of it.

**Green Island**, a small islet nearly half a mile from the Greencastle shore, is surrounded by an extensive rocky foreshore, with outlying rocks to the eastward, between which and the shore is a narrow channel, where small vessels find good anchorage in  $3\frac{1}{2}$  fathoms, with Greencastle bearing N.E. by E.  $\frac{3}{4}$  E., one cable off shore. But to approach this anchorage requires intimate local knowledge.

Northward of Green island there is a series of dangers extending for nearly a mile towards Stalka rock. Frazer rock, with 6 feet water, is the southernmost of these.

A pinnacle rock, having 8 feet over it at low water springs, and 20 feet close to, lies about 80 yards S.W. by S. from Frazer rock; a *red* buoy with staff lies immediately to the south-west of it. From the rock, Greenore pier light bears N.W.  $\frac{3}{4}$  W.; Earl rock perch, N.  $\frac{1}{2}$  W.; and north angle of Greencastle, E.  $\frac{3}{4}$  N.

On the western edge of the rocky ground which extends from Green island to Halpin rock are several patches of 12 to 17 feet.

**Earl Rock**, dry at low water, and marked by a beacon, is 3 cables E. by N. from Greenore point; a *red* buoy marks a patch of 4 feet one cable south of the beacon; and midway between Earl and Frazer rocks, is a rock with 3 feet water.

The usual channel to the upper part of the lough, which is to the westward of these dangers, is encumbered with several rocky patches, with from  $8\frac{1}{2}$  to 18 feet water; the shoalest of these, Halpin rock, with  $8\frac{1}{2}$  feet water, and marked by a *black* and *red* buoy on its south side, is off Greenore point, with the lighthouse bearing N.W. by W. 2 cables distant, and the coastguard flagstaff W.  $\frac{3}{4}$  S. A cable to the eastward of the rock there is only 9 to 11 feet water. In the absence of sufficient buoys or leading marks these dangers render the navigation towards the upper waters of the lough difficult at low water.

**Stalka Rock**, uncovered one hour before low water, and marked by an iron perch, is half a mile N. by W. from Earl rock. A ridge of sand, partly uncovered at low water, connects these rocks, and is continued to the northward of the Stalka, half a mile from which in that direction there is but 5 feet water, with 16 to 18 feet between it and the Stalka. Within, or between this ridge and the great eastern banks, is a clear channel of 1 to 2 cables in width, and with from 3 to 5 fathoms water, extending down to the anchorage within Green island, and used by small vessels passing between that island and Warren point. A *red* buoy lies S.W. by W.  $1\frac{1}{2}$  cables from the perch on Stalka rock.

**Watson Rocks**, with 5 to 6 feet water, form the southern portion of an extensive bank, that runs in a N.W. by N. direction for more than half a mile, carrying from 7 to 11 feet over its northern end, and separated from the great bank that covers the western shore by a narrow channel of 12 and 13 feet water. A *black* buoy marks the eastern side of the rocks.

**Black Rock**, on the outer margin of the western bank, half a mile from the shore, is covered at half-tide, and marked by a perch. From Black rock the edge of the bank runs in a N. by W. and N.N.W.  $\frac{1}{2}$  W. direction  $1\frac{1}{2}$  miles, to the *black* buoy on the north spit of Carlingford bank, where it is very steep-to.

**Carlingford Bank** is the portion of the western bank in front of the town of Carlingford, its outer edge dries and is steep-to; between it and the shore there are 4 or 5 feet water. A *black* buoy, in 10 feet water, marks its north extreme, with Carlingford old castle bearing S.W.  $\frac{3}{4}$  S., and 5 cables distant from the shore abreast it. Northward of Carlingford bank the western shore is skirted by a flat with 8 or 10 feet water, extending to the distance of about 3 cables off, and affording capital anchorage for coasters and small vessels.

**Killowen Bank**, opposite Carlingford bank, bounds the eastern side of the channel; a *red* buoy in 9 feet water marks its outer edge, with Carlingford old castle bearing S.W. by W.  $\frac{1}{4}$  W., and the *black* buoy on Carlingford bank, W. by N.  $\frac{1}{4}$  N.,  $4\frac{1}{2}$  cables distant. Killowen bank uncovers from the shore out to the *red* buoy, and extends for about a mile northward of it; beyond this the water deepens to 8 and 10 feet, which are the prevailing depths all over Rostrevor bay.

The narrowest part of the channel, 3 cables in width, is between the buoys on Killowen and Carlingford banks, and its deepest part, 20 fathoms, is 3 cables to the northward of Carlingford buoy;  $1\frac{1}{2}$  miles above that buoy the deep water channel terminates.

**Gunnaway Rock**, covered on first quarter flood, and marked by a

pole, is S.S.E., 3 cables from Warren point ; between it and the point are some rocks that uncover at low water.

**Black Rock**, on the opposite shore, marked by a perch, and covered at  $3\frac{1}{2}$  hours flood, is on the outer edge of the stony fore-shore that borders this side of the lough. Three-quarters of a mile northward of Black rock, and extending from the west shore to within 400 feet of the quays at Warren point, is the Scar, a bank composed of boulders and gravel, dry at low water ; and marked on its outer edge by a small *black* buoy.

**Anchorages.**—A vessel may anchor anywhere to the northward of Sheep rock, protected from the effects of southerly gales by Limestone rocks. The tide here is weak ( $1\frac{1}{2}$  knots), the holding-ground good, and, although with southerly gales a little swell may be experienced at high water, there is nothing injurious in it, and it quickly subsides with the falling tide. A good berth will be found with Haulbowline lighthouse, a little open eastward of the Blockhouse, bearing S.E.; and with Green island between Greencastle and Greencastle point, in 7 or 8 fathoms, sand and shells ; or nearer Greenore point, in Firemount road, taking care not to bring Green island to the southward of E.  $\frac{1}{2}$  S., to avoid the foul ground that lies between it and Greenore point ; and having Newry mountain open of Greenore point, to clear the bank that fronts the western shore.

Small vessels may anchor on the eastern shore, out of the tide, half a mile to the southward of Green island, in 5 or 6 fathoms water, close to the edge of the flats, which are steep-to.

There is good anchorage for small vessels to the northward of Greenore point, in 4 to 6 fathoms, with the point bearing South, and Green island showing between the leading lights. But the anchorage most resorted to by wind-bound coasting vessels is about three-quarters of a mile to the northward of Carlingford, on the flat within Carlingford buoy, in 8 to 10 feet water, the old castle bearing S. by W.  $\frac{1}{2}$  W. Also on the opposite shore to the northward of Killowen point, with Wood house bearing N.E.  $\frac{1}{4}$  N., in 10 feet water. Vessels that can take the ground without injury, may bring up anywhere over Rostrevor bay, or off Warren point, and lie on a bottom of soft mud, partly water-borne. In the deep channel of the lough there is room for upwards of a hundred sail to lie at their anchors in from 4 to 20 fathoms water, the latter depth is, however, confined to one spot, the general depth not being more than 4 to 9 fathoms.

For the convenience of communicating with Warren point and Newry, vessels usually go up as far as they can lie afloat, and anchor in 6 fathoms, with Wood house bearing N.E.  $\frac{1}{4}$  N. ; Carlingford old castle, S. by W.; and Warren point, N.N.W.  $\frac{1}{4}$  W.,  $2\frac{1}{2}$  miles distant ; but they will be equally safe in any part of the channel southward of this, to as far down as Stalka rock.



**TIDES.**—It is high water, full and change, at

	h. m.			ft. in.			ft. in.	
Cranfield point - at	11	0	mean springs rise	16	0	neaps rise	12	0
Greencastle point „	11	0	„	16	0	„	11	0
Warren point - „	11	10	„	14	6	„	12	0
Victoria lock - „	11	43	„	13	4	„	10	9
Needham bridge, }	11	43	„	6	10	—		
Newry - }								

In Rostrevor bay and the upper parts of the lough the stream is feeble. Off Carlingford village both the ebb and flood streams run  $1\frac{1}{2}$  knots. Abreast Greenore point it runs 2 knots. The strongest tide is between the Blockhouse and Scars, where it runs  $4\frac{1}{2}$  knots. The ebb stream sets fairly in the direction of the channel of the lough and also of the cut through the bar; the flood stream within Haulbowline sets in the direction of the channels, but outside it sets across the bar towards Cranfield bay.

From the tail of the Scars the ebb takes a south-westerly course for Morgan pladdy, setting through Hoskyn channel, and out over the bar in that direction, and losing its velocity as it proceeds, until at the distance of one mile outside the bar there is little stream perceptible. At Helly-hunter buoy the harbour stream is slightly felt. Both streams set over the bar at the rate of  $3\frac{1}{2}$  knots. The flood sets obliquely across Hoskyn channel at from  $1\frac{1}{2}$  to  $2\frac{1}{2}$  knots; as the lighthouse is approached it increases in force, and strikes across the channel, over the Scars into Cranfield bay, causing a strong eddy along the shore of Blockhouse island; both which must be carefully guarded against by sailing vessels in light winds, as in the first case she is in danger of being carried inside the Scars, and in the second will become unmanageable in the eddy, and be in danger of drifting on Blockhouse island.

**Directions.**—A vessel entering lough Carlingford with the flood tide should, particularly at night, be careful not to be set to the eastward of the line of the leading lights, and to starboard her helm so soon as the low *red* light in Haulbowline lighthouse is seen, as the leading line is nearer the Cranfield shore than Haulbowline; by day, the buoys are an efficient guide.

A vessel running for lough Carlingford in thick weather should endeavour to make the land to the eastward of the entrance, where the coast is more free from outlying dangers than it is either off the entrance or to the westward of it, and not to approach nearer than the depth of 14 or 15 fathoms until her position is well ascertained. In clear weather the lough may be readily distinguished by Carlingford mountain to the westward, and Mourne mountains to the eastward, with Haulbowline lighthouse standing conspicuously in the entrance.

**In daytime**, having made out the entrance, bring all the buildings on Greenore point open south-west of Haulbowline lighthouse, bearing to the northward of N.W.  $\frac{1}{2}$  N., to clear Hellyhunter rock, off which is a *red* bell buoy, which must be left on the starboard hand; and when the leading lighthouses are in line, bearing N.N.W.  $\frac{1}{4}$  W., keep them so, and steer between the buoys marking the channel, leaving the *black* buoys on the port hand, the *red* buoys on the starboard hand. If the wind is light, be careful not to be carried by the flood into Cranfield bay, or of becoming entangled in the eddy on the shore of Blockhouse island.

When the north end of the trees near Carlingford castle opens of the lighthouse wall at Greenore point, bearing N.W.  $\frac{1}{4}$  W., proceed with this mark on for the anchorage, and it will lead midway between the bell buoy of New England rock, and the *red* buoy marking Vidal rock on one hand, and the *black* buoys of Blockhouse and Sheep rocks on the other hand. When Sheep rock perch bears S.W. and the inner pile lighthouse N.N.E.  $\frac{1}{4}$  E., haul more to the westward and prepare to anchor. But if intending to proceed to Warren point, continue on a N.W.  $\frac{1}{4}$  W. course towards Greenore point, keeping the north end of the trees at Carlingford open of the lighthouse wall. When within half a mile of the point the trees may be shut in, to pass to the westward of Halpin rock; and when the coast-guard flagstaff bears W.  $\frac{1}{4}$  S., the vessel will be abreast that rock, and must steer N. by W.  $\frac{1}{4}$  W. until the flagstaff is brought to the westward of Greenore lighthouse, bearing S.  $\frac{3}{4}$  W., which mark will lead between Stalka and Watson rocks. Between Halpin rock and the point there are patches of 15 and 18 feet water, and between Stalka and Watson rocks from 20 to 25 feet at low water. Proceeding between Stalka and Watson rocks on a N.  $\frac{3}{4}$  E. course, when Stalka perch bears E.  $\frac{1}{4}$  N., haul up N.N.W.  $\frac{3}{4}$  W., which will lead straight up through the channel of the lough. Pass between the buoys on Killowen and Carlingford banks, and continue on the same course towards Warren point, observing to pass between Gunnaway and Black rocks.

By attending to the foregoing directions a vessel may run for the anchorage below Greenore point, and under favourable circumstances for the upper anchorages off Carlingford, or Warren point, but with a foul wind the assistance of a pilot is necessary

**At night**, having made out the entrance, avoid Hellyhunter rock by keeping Greenore light in line with, or just open west of Haulbowline light, N.W.  $\frac{1}{2}$  N., and bring the leading lights in line, N.N.W.  $\frac{1}{4}$  W., which will lead over the bar in 15 feet; when the low *red* light in Haulbowline lighthouse is seen, steer for Greenore light, leaving on the starboard hand the *bell* buoy of New England rock and the *red* buoy of Vidal rock, and on the port hand the *black* buoys off Haulbowline and Block-

house island. When the inner leading light becomes obscured haul to the westward and anchor in 7 or 8 fathoms, or proceed up past Greenore point and anchor when Greenore revolving light and pier light are in line.

A stranger should not enter this harbour at night until the channel within the bar has been properly marked.

**The COAST** to the eastward of lough Carlingford, is for the most part composed of ranges of low clay cliffs, based on a fore-shore of rocks and boulders, and backed by the lofty summits of Mourne mountains. From Cranfield point it holds E. by N.  $\frac{1}{4}$  N. for about 4 miles to Leestone point, which is low with a huge granite boulder at its extremity.\*

**Annalong Harbour**, dry at three-quarters ebb, at about  $3\frac{1}{4}$  miles eastward of Leestone point, consists of a small dock excavated in the shore at the mouth of a mountain stream. The rocky fore-shore uncovers to the distance of nearly one cable from the entrance of the dock. Large quantities of granite, raised in Mourne mountains, are shipped here. Nearly one mile to the north-east of this is Mullartown point, the western limit of Dundrum bay.

For 2 miles eastward of Cranfield point the shore continues foul, and must not be approached nearer than the distance of  $2\frac{1}{2}$  miles, or into a less depth than 8 or 10 fathoms. Between this and Leestone point small vessels may approach it to a distance of three-quarters of a mile, or into 6 or 7 fathoms, but large vessels should not come into less than 10 fathoms. One mile eastward of Leestone point, and at the distance of half a mile from the shore, is a rocky patch of 9 feet water; with this exception it is clear of danger, and may be approached to within half a mile, or into 6 and 7 fathoms water, to as far as Mullartown point, where foul ground, with from 3 to 4 fathoms water, extends for  $1\frac{1}{4}$  miles from the shore.

**DUNDRUM BAY**, between Mullartown point and St. John point, bearing from each other E. by N.  $\frac{1}{2}$  N. and W. by S.  $\frac{1}{2}$  S., 10 miles distant, is nearly 5 miles deep, with soundings of 10 to 14 fathoms between the points of the bay, decreasing to 5 fathoms at the distance of one mile from its shores, which are everywhere shallow. Mourne mountains skirt the western shore. Slieve Donard, their highest peak, rises within the distance of  $1\frac{1}{2}$  miles from the beach, to the height of 2,796 feet, and is a very imposing feature. Of the interior mountains, Slieve Croob, 1,755 feet high, is conspicuous from all parts of the bay. The northern shore of the bay is composed of sand-hills, which are penetrated by a narrow channel leading to the dry harbour of Dundrum. The eastern shore is formed by the low promontory St. John point, having a lighthouse at its extremity.

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\* See Admiralty chart :—Ireland, east coast, sheet 2, lough Carlingford to Larne, No. 45 ; scale,  $m = 0.57$  inch.

The west shore continues foul and rocky for more than 2 miles to the northward of Mullartown point, and  $1\frac{3}{4}$  miles north of it, and 3 cables from the shore, is a rock that dries at low water. To the northward of this the shore is clear of danger, but as Newcastle is approached it becomes shallow, there being not more than 3 fathoms water three-quarters of a mile from the pier.

The rock of Craigalea stands conspicuously on the sandy shore nearly midway along the head of the bay, and about  $4\frac{1}{4}$  miles eastward of Newcastle. A short distance eastward of Craigalea, a reef extends for more than a mile from the shore, terminating in Cow and Calf rocks, which are barely covered at high-water spring tides, and form a useful mark for the extremity of the reef. One and a quarter miles eastward of the last-named rocks, a ridge, with from  $3\frac{1}{4}$  to 4 fathoms over it, extends in a southerly direction for  $1\frac{1}{4}$  miles from the shore.

The coast from Craigalea to St. John point forms several indentations and rocky points. Rosglass bay, in the east angle of Dundrum bay, has a flat shore encumbered with outlying rocks, and not more than 5 fathoms water at the distance of one mile.

**Life-boats.**—Two life-boats are stationed in Dundrum bay.

**Newcastle** is at the foot of the mountains, in the north-western corner of the bay, and  $4\frac{1}{2}$  miles northward of Mullartown point. The harbour, which was always an unsafe place with southerly or south-easterly winds, from the heavy ground swell that runs into it, is now (1876) in a ruinous state, the south pier having been wrecked, and stones and gravel lie across the entrance; vessels, however, discharge at the north side of the north pier. The approach is clear of danger, but subject to squalls and flaws of wind from the high mountains. The town possesses great attraction as a watering-place; it is nearly a mile in length, and contains several handsome buildings. Tullymore park, the magnificent seat of the Earl of Roden, is situated about  $1\frac{1}{2}$  miles to the north-west of it.

**Dundrum Harbour**, the entrance to which is  $1\frac{1}{4}$  miles to the westward of Craigalea, and  $5\frac{1}{2}$  miles to the westward of St. John point, is for the greater part dry at low water, and of difficult approach. The village of Dundrum, with its quay, is on the north shore of the harbour, at the foot of a small rounded hill, surmounted by an old castle, which being brought to bear N. by W. leads directly to the entrance. Lord Downshire's marine villa, on the sand-hills near the shore on the west side of the channel, also assists in pointing it out. The bar, consisting of shifting sand, with seldom more than 1 or 2 feet water on it, has of late years moved considerably to the eastward. A *black* buoy is moored outside it in 24 feet water, but is frequently washed away. St. John point lighthouse, in line with Cow and Calf rocks, S.E. by E.  $\frac{1}{2}$  E., leads to 2 feet water on the bar.

Half a mile within the bar is a mussel bank called the Scar, which formerly obstructed the passage as it did not cover until the tide in the bay had risen 3 ft. 6 in. above the level of low water springs, but, in 1860-5, a channel, 100 yards wide, was cut through it and dredged down to a level with the bar, at the cost of Lord Downshire, so that vessels drawing from 9 to 11 feet can proceed up to the quay two hours before high water. In the entering channel, above Lord Downshire's villa, and abreast the perches on the shore, is a pool where small vessels of 8 feet draught may lie afloat in safety. There is a good quay at the village on the north side of the harbour. Steam-vessels ply regularly to Liverpool.

**Directions.**—To sail into the harbour, when there is sufficient water over the bar, bring the old castle of Dundrum over the west point of the entrance, bearing N. by W. ; the store at the quay will then appear half its length open, which is the pilot's mark. Proceed with either mark until the villa bears N.W.  $\frac{1}{4}$  N., or Craigalea closes with the sand-hills, when a vessel will be above the Scar, and must steer N.  $\frac{3}{4}$  E. When above the first perch, she may bring up in the pool in 8 or 10 feet at low water. The channel now trends westward, and again northward towards the quay, and is marked by stakes. To a stranger the assistance of a pilot is necessary, who will come off on a signal being made at the bar. Southerly winds send a heavy sea into Dundrum bay, and at such times the bar cannot be approached.

**ST. JOHN POINT LIGHT.**—The lighthouse on St. John point, built in 1844, exhibits, at an elevation of 62 feet above high water, an *intermittent red light*, visible *forty-five seconds*, and suddenly eclipsed for *fifteen seconds*; it may be seen in clear weather at the distance of 12 miles, and is shaded across Dundrum bay, when bearing southward of E. by S.  $\frac{1}{4}$  S. The point is moderately steep-to, having 12 and 13 fathoms one-third of a mile to the southward of it.

**TIDES.**—It is high water, full and change, at

	h.	m.		ft.	in.		ft.	in.
Newcastle - at 10 52			Springs rise	16	0	Neaps rise	12	9
Dundrum quay „ 10 43			„	12	8	„	10	0

Off St. John point the streams from the north and south channels meet. Near here the stream bends to the westward, taking the curve of Dundrum bay, which must be guarded against. Close to the shore the stream runs  $1\frac{1}{2}$  knots at springs, but at a distance there is scarcely any tide.

**Directions.**—The seaman should be very cautious in approaching Dundrum bay in unsettled weather, for if caught within the heads a dull sailing ship could scarcely work out again. With on-shore winds there is a considerable in-draught, and a very heavy sea running into the bay.

With the wind from west or north-west it is exposed to heavy gusts from Mourne mountains.

In moderate weather, a vessel may stand towards the north shore into 9 or 10 fathoms, or until St. John point bears E. by S.  $\frac{1}{4}$  S.; at night, tack before St. John point light becomes obscured, which will clear Cow and Calf rocks. Off Mullartown point the western shore must not be approached nearer than 2 miles, or to the depth of 13 or 14 fathoms. Three miles eastward of this point is a rocky bank of 8 fathoms. In all other parts of the bay the soundings are regular.

On passing to the eastward of St. John point, Killough bay and harbour will open, and to the eastward of these the creek of Ardglass.

**KILLOUGH HARBOUR**, a dry harbour at the head of a bay encumbered with dangers is much resorted to by coasters, and by fishing

*To face page 132.*

**Dundrum harbour—Tidal lights.**—Two fixed lights are exhibited from the old quay of Dundrum harbour, from  $2\frac{1}{2}$  hours before high water until 2 hours after high water.

These lights are exhibited for the convenience of local traders only.

41331.

With the gun . . .

10 or 11 feet. In moderate weather a vessel may anchor in either of these berths to wait for tide to enter the harbour.

To clear the rocks which extend from Ringfad point and Coney island, bring Bright castle in line with the store-house near the inner end of the west pier, bearing N.W. by N. Killough church tower and the gateway on the west pier in line, N. by W.  $\frac{1}{4}$  W., leads eastward of Water rocks and Big and Little Plates. To enter the harbour, run in on either of these marks, until Cotters house (a white house at the head of the harbour) comes in line with the west pier head, N.  $\frac{3}{4}$  E., when haul up towards the harbour, and run alongside the west pier. If the wind is light and the tide still flowing, send a rope to the west pier head

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\* See plan of Killough bay and harbour on Admiralty chart, Ireland, east coast, sheet 2, from lough Carlingford to lough Larne, No. 45.

in time, and have an anchor ready, as the tide may carry a vessel up the harbour.

With westerly winds, vessels may pass to windward of Water rocks and the Plates, by bringing Cotters house a little inside the west pier head, until Water rocks have been passed, and then opening the house a little to the eastward of the pier head, to pass between the Garter and Plates. Towards high water and when there is no swell in the bay there is little danger in this course, for by the time a vessel can enter the harbour she will have water over the Plates.

**ARDGLASS**, a small pier harbour (now in ruins) with 12 to 24 feet water within it, is about one mile eastward of Ringfad point. The promontory of Ringfad, between Killough and Ardglass, is distinguished by a conical hill surmounted by a tower, which, as well as Ardglass church steeple, is conspicuous from the offing, and serves to point out the harbour. There are several old castles in the neighbourhood, three of which are in the town.\*

The shores at the entrance of the bay are rocky and bold-to. The ruined pier is on the west shore. At the head of the bay is a dry dock, in which small vessels lie in safety. Phenick point, on the east shore, is steep-to, but abreast the pier the rocks uncover to the distance of a cable from the shore. Rocky prongs extend from both shores within the pier, and are also scattered over the beach at the head of the bay, which vessels running into the dry dock must be careful to avoid. The anchorage is between the ruined pier and the rocks to the northward of it, which are marked by a large stone beacon.

With off-shore winds vessels may anchor outside the pier in from 6 to 9 fathoms water. Vessels bound in to the pier must give the ruins (the position of which, if covered, will generally be known by the ripple over them) a moderate berth, and round in between them and the stone beacon, and moor with a hawser to the pier. South-easterly winds send in a heavy sea at high water. In the winter season, or during unsettled weather, this is a very unsafe berth; vessels trading to Ardglass should not risk its exposure, but haul into the dry dock.

Although the area sheltered by the pier was very limited, and much too small for a refuge harbour, it was undoubtedly of great benefit to the herring fishery, the vessels engaged in which, amounting to a large fleet in the season, still cling to its ruins for the partial shelter it affords.

**LIGHT.**—A small *fixed red* light is shown from the window of a house at the head of the bay, visible 6 miles.

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\* See plan of Ardglass, on Admiralty chart, Ireland, east coast, sheet 2, from lough Carlingford to lough Larne, No. 45.

From Ardglass eastward to as far as Guns island, there is a bold rocky shore, of moderate elevation, and free from danger. Sheepland mill, one mile eastward of Ardglass, is conspicuous from the sea; in the rocky shore beneath it there is a creek and landing-place for boats.

**Guns Island** lies one mile south-west of Killard point, it is about one-third mile long, 96 feet high, and is connected with the main at low water by a gravelly bank. A square obelisk, surmounted by a ball, and 25 feet in height, which is used as a sea-mark, stands at the south end of the isle.

**LOUGH STRANGFORD ENTRANCE**,\* between Killard point on the west and Ballyquintin point on the east, is 7 miles north-eastward of St. John point, and nearly midway between Carlingford and Belfast loughs. Within it are several anchorages affording good shelter, plenty of water, and excellent holding-ground, and there is sufficient depth for the largest ships to enter at all times of the tide. But its usefulness as a port of refuge is impaired by the rapidity of the tide, which prevents vessels entering during the strength of the ebb.

With an ebb tide and the wind strong between S.S.W. and East, there is a heavy breaking sea just outside the entrance; as the tide slackens this subsides, and the navigation is then free from danger, and a safe anchorage easily gained. A great many coasters frequent it for shelter, and if it were better known many more that now remain outside, exposed to the dangers of a long winter's night in the Irish channel, would gladly avail themselves of it.

**Killard Point** and the western shore are of moderate elevation, and backed by high hills; near this shore Kilclief castle and church are conspicuous, with the spire of Ballyculter church about  $1\frac{1}{2}$  miles to the north-west. In the middle of the entrance will appear the tower on Angus rock. Ballyquintin point is low and shelving, but Ballywhite hills above Portaferry are conspicuous, attaining an elevation of 339 feet. Approaching from seaward, the most prominent objects near the entrance are South rock (disused) lighthouse, Guns isle, and Portaferry windmill.

**Portaferry**, on the eastern shore, about  $3\frac{1}{2}$  miles within the points of entrance, has a good quay, and a clean beach, where vessels take the ground in safety.

**Strangford**, a neat little village, opposite Portaferry, has a snug creek, with 2 and 3 fathoms water, sheltered by a small island in front called the Swan, where vessels moor in complete security out of the tide way; here are also two good quays, and a clean beach for vessels to take the ground when necessary.

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\* See Admiralty plan of lough Strangford, No. 2,156; scale,  $m = 2\cdot3$  inches also, plan on chart of Irish channel, sheet 1, No. 1,825a.



There is a ferry between Portaferry and Strangford. Cars run daily from Strangford to Downpatrick, 7 miles distant, and from Portaferry to Newtownard, 16 miles distant, both which towns communicate with Belfast by rail. Supplies to a limited extent may be obtained, and very good fresh water from wells. Repairs of wooden vessels may also be effected. Pilots will board outside the entrance on the usual signal being made.

The entrance to lough Strangford is divided into two channels by Angus rock.

**West Channel**, with 13 feet water, is narrow and intricate, and skirted by dangerous rocks. The mark for the best water is to bring Kilclief church in line with the west end of a grove of trees in Lord Bangor's park, bearing N.N.W. westerly, until Ballywhite mill comes in line with the high-water boundary at Bankmore point, N. by E.  $\frac{1}{2}$  E. northerly, when haul up for it. Strangers should not attempt this channel without a pilot; but as the stream slacks here on the flood sooner than in East channel, those well acquainted with the port take advantage of it to get to sea earlier than they could by East channel.

**East Channel**, between Angus rock and the shoals bordering Ballyquintin point, is the safer and usual entrance, where in the fairway is not less than 6 or 7 fathoms at low water. The best leading mark for this channel, is to keep the northernmost house in the town of Portaferry just open of Bankmore head, N.  $\frac{1}{4}$  E., which will lead in the middle of the channel, and eastward of the Meadows, where the channel is little more than one cable wide.

**St. Patrick Rock**, 3 cables to the south-east of Killard point, is steep to all round, and is covered at 4 hours flood, when its position is marked by a conspicuous iron perch 30 feet high. There is a safe passage between it and the shore, with from  $3\frac{1}{2}$  to 7 and 8 fathoms water. The windmill on Kearney point kept open, bearing N.E., leads south-eastward of it.

**Killard Point** is bordered by a rocky fore-shore. Craiglewey rocks, extending from it more than 3 cables in a south-westerly direction, are prolonged into a sunken reef 3 cables farther in the same direction, with from  $1\frac{3}{4}$  to  $2\frac{1}{2}$  fathoms over it, which, vessels anchoring in Bandarragh bay must be careful to avoid. Northward of the point, rocky and foul ground, with from one to 2 fathoms water over it, extends across West channel to Angus rock.

The west shore of the entrance continues foul and rocky, from Kilclief castle northward to as far as the isle of Valla, opposite Bankmore head.

**Angus Rock** or reef, nearly in the middle of the entrance, including Garter and Potts rocks, is about half a mile long and one cable broad, the

greater part uncovering at low water. Potts rock, near the south end of the reef, about half a mile within the points of entrance, uncovers on spring tides. Garter rock, one cable northward of the Potts, uncovers at half ebb, and has a wooden perch on its south-east elbow.

Angus rock is the most extensive portion of the reef; near its north end, on a part of the rock that never covers, is a stone tower,\* 45 feet high, built for a lighthouse, and capped by a conical framework; at one cable northward of the tower the reef terminates. On Mid-rock, half way between Angus tower and the perch on Garter rock, is a truncated stone obelisk, surmounted by a perch. Both on its north and east sides the rock is steep-to, but to the westward and southward it is fringed by dangerous rocks. The channel into the lough is between this reef and the shoals off Ballyquintin point.

**The Meadows**, a detached shoal lying N.N.E. 2 cables distant from Angus rock, has near its south edge a small rock with 10 feet water, on other parts there is 16 to 18 feet, and between it and Angus rock from 7 to 9 fathoms. It is a good deal in the way of navigation, but there is a safe passage on each side of it.

**Ballyquintin Point** is surrounded by dangers, and fringed with outlying rocks, which uncover in places to a distance of nearly 4 cables from the shore. Pladdyug, one of these rocks, on the west side of the point bordering East channel, uncovers on spring tides, and is marked by a stone beacon 20 feet in height. Between it and Ballydock point, to the northward, are several detached rocks, which like the Pladdyug only show themselves on spring ebbs, and which must be carefully avoided by a vessel working in or out. The Knob, a rocky patch with 8 feet water, is 2 cables southward of Pladdyug. Bar Pladdy, with 9 feet water, one cable farther in the same direction, is marked by a *black* buoy on its southern edge in 6 fathoms water. Small vessels may pass between the Bar Pladdy and Knob, or between them and the point.

The tower on Angus rock, in line with Kilclief castle (an ancient square tower close to the west shore), bearing N.W.  $\frac{1}{2}$  N., leads between the Bar Pladdy and Knob; and Ballyculter church spire, in line with the south-west corner of Kilclief castle, and the stone obelisk on Angus mid-rock, N.W. by N., leads south-west of them.

St. Patrick rock perch, in line with the south end of Guns island, W.S.W., leads southward of the foul ground off Ballyquintin point.

**Gowland Rock**, on the east shore, half way up the entrance, uncovers at 2 hours ebb; its outer edge is marked by a white stone beacon, 16 feet in height. On the opposite side of the channel, on Cloghy rocks,

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\* A light on this tower would be of great service to the passing trade, and would enable vessels to take refuge here by night as well as by day.

is another stone beacon, 26 feet high, coloured in *red* and *white* belts, with a fork on the top. The channel between them is one quarter of a mile wide, with a depth of 17 to 19 fathoms water.

On the eastern shore, one-third of a mile above Gowland rock, is the bluff head of Bankmore, with a small ruin on its summit. It is steep-to to the north-west, but a rocky ledge extends for nearly 2 cables to the south-west of it, with but 24 feet over it and 20 fathoms immediately outside. Routen-wheel, a whirlpool, just to the southward of this ledge, is dangerous to boats in rough weather, and must at all times be avoided, as a vessel falling into it becomes unmanageable.

**Cloghy Rocks**, on the west shore, and nearly opposite Gowland rock, are for the greater part uncovered at low water. A beacon tower, 26 feet in height, painted with *red* and *white* belts, and with a fork on the summit, is on the northmost rock called Salt rock. The eastern face of this cluster is steep-to, and within them is a snug pool, approached from the northward, where small vessels may moor in safety. Northward of this the west shore continues rocky, and is generally steep-to, but lying off the isles of Valla are two detached rocks. One abreast Bankmore head, with but 4 feet over it, is at the mouth of a little bay, 400 feet from the shore.

**Walter Rock**, with a perch to mark its position when covered, is one quarter mile above Portaferry, and nearly a cable from the east shore. As there is a strong tide setting past it, vessels going into Ballyhenry bay must be cautious of passing too close to it. On the north side of this bay, off Ballyhenry point, are some dangerous rocks; the outer one, called Little Ballyhenry rock, is  $1\frac{1}{2}$  cables from the shore, and uncovers at low water.

**Anchorage.—Cross Road**, on the west shore, three-quarters of a mile above Kilclief castle, and about half a mile southward of Cloghy beacon, affords excellent anchorage for small vessels, out of the tide-way, in from 6 to 8 fathoms, muddy bottom. A white pillar on the shore in line with a pole on the hill behind, or Ballyculter church spire in line with the pillar, and Cloghy beacon, showing between Portaferry church and the north houses in the town, points out the anchorage. Vessels running into this anchorage from southward must be careful to avoid a rocky ledge, with but 3 feet over it, that bounds it on that side. Cloghy beacon in one with the north house of Portaferry leads on its outer edge; the houses a little open leads outside it. But the principal anchorages resorted to by coasters seeking refuge here, are two sheltered bays called Audley and Ballyhenry roads.

**Audley Road**, on the west shore, under Audley castle, an ivy-covered tower on a hill on the north side of the bay, two-thirds of a

mile above Strangford, affords excellent anchorage for small vessels in from 2 to 7 fathoms water, good holding-ground, out of the tide-way.

When entering Audley road from southward, care must be taken not to round Old Court point too close, on account of Zara shoal, a rocky shelf with but 9 feet water, that extends off to northward of the point. Bankmore head kept open of Old Court point, until Portaferry church comes to the northward of the town, and in line with the gate-house in Portaferry demesne, clears it. Anchor with this last mark a little open, Audley castle bearing W. by N.  $\frac{3}{4}$  N., and Don O'Neil (or Rat island) just shut in, in 6 or 7 fathoms. Audley point is steep-to.

**Ballyhenry Road**, on the opposite shore, three-quarters of a mile above Portaferry, has good anchorage in from 9 to 4 fathoms, out of the tideway. Here the bottom is very uneven, rocky patches of 4 fathoms occurring, with 6 and 7 fathoms, sand and mud, around them. A mud flat with 7 and 8 feet water over it runs round the bight of the bay, extending one cable from the shore. The best berth is with Castleward house its own breadth westward of Audley castle, and Bankmore ruin in line with the perch on Walter rock, in  $7\frac{1}{2}$  fathoms, gravel and sand.

**Chapel Island Road**, off Chapel island, on the south shore of the lough, is  $1\frac{1}{4}$  miles to the north-west of Audley point, where large ships that could not conveniently take up a berth in the confined anchorages of Audley or Ballyhenry roads, may be brought up in safety, with Tara hill closing on Audley point, bearing S.E.  $\frac{1}{2}$  S., or farther to the southward, until Portaferry mill closes on Chapel island, bearing S.E.  $\frac{3}{4}$  E., from 2 to 6 cables from the island, and with Jackdaw island bearing between S.W.  $\frac{1}{4}$  S. and S.  $\frac{1}{4}$  E., in from 9 to 16 fathoms, mud and sand. Do not go farther to the westward than to bring Jackdaw island on a S.  $\frac{1}{4}$  E. bearing, or Don O'Neil island N. by E.  $\frac{1}{4}$  E., to avoid the shoals at the entrance of the Quoile. A good berth is with Audley castle on with the left extreme of the beach of Chapel island, Scrabo monument in line with Don O'Neil island, and Delamont house over the cliff at the north end of Green island.

**TIDES.**—It is high water, full and change, at

		h. m.		ft. in.		ft. in.
Killard point	-	10 53	springs rise	14 0	neaps rise	11 6
Strangford quay	-	0 31	„	10 6	„	8 9
Killyleagh	-	0 40	„	11 0	„	9 3
Quoile quay	-	0 45	„	11 0	„	9 3
Kircubbin	-	0 42	„	11 6	„	9 6
Head of the lough	-	0 44	„	11 6	„	9 6

The extreme rapidity of the tide streams is a feature of great importance in the navigation of the entrance to Strangford lough. Spring tides have been stated to run from 8 to 10 knots, and the strong races about the

entrance with southerly winds would lead to this conclusion, but actual experiment proves it to be not more than 7 knots in the narrows between the stone beacons, and  $5\frac{1}{2}$  knots in the fairway, between Angus rock and Pladdylug. This rapid tide flowing over an irregular rocky bottom causes several whirlpools, the largest, called the Routen-wheel, being in the narrows near Bankmore head. Off the mouth of the lough, on a South bearing, the outset will be felt at a distance of  $3\frac{1}{2}$  miles, sweeping in a curve to the north-east with the ebb, and to the south-west with the first of the flood. In fine weather overfalls extend in a narrow stream of broken water for more than one mile southward of St. Patrick rock. The indraught is not felt at that distance. It is important for the seaman to remember, that in the entrance both streams continue to run from 1 hour and 40 minutes, to 2 hours and 20 minutes, after high and low water at Killard point, and for about half an hour after the same occurrence at Strangford quays, or until the water within and without the lough has attained the same level. To know when the flood stream will have ceased, find the time of high water at Strangford quay, half an hour after which the stream turns throughout the channel, running 6 hours each way, with but little slack water between each stream.

At the north end of Angus rock the flood has a westerly set towards the Meadows, which must be allowed for in light winds, and the ebb sets strongly across the north end of Angus rock to the eastward. The flood stream sets towards Walter rock, and the ebb stream presses into the bight, north of Bankmore head. With these exceptions the tide sets fairly through the channel. With the ebb there is a strong eddy along the west side of Angus rock; and the same with both streams under every projecting point. The rapid tide stream issuing from the entrance continues its course obliquely across lough Strangford towards Don O'Neil island, leaving a considerable space of comparatively still water to the north-west of Chapel island.

**Directions.**—Approaching lough Strangford from seaward, the most prominent objects are the sea-mark (a white obelisk) on Guns isle, and a windmill above Portaferry; the latter may be seen in clear weather at a considerable distance. With southerly winds and an ebb tide there is always a broken sea about the entrance, which becomes dangerous for small vessels in gales from that quarter. Vessels arriving off the port under these circumstances must not attempt to enter, but keep an offing until the tide slacks. With off-shore winds a vessel waiting for tide may anchor off Ballyquintin point, in 7 or 8 fathoms, with St. Patrick rock perch in line with the south end of Guns island.

Approaching from the southward leave St. Patrick rock on the port hand, when abreast it the entrance will appear quite open up to Portaferry,

and a course may be steered towards the tower on Angus rock, bringing it to bear N.  $\frac{1}{2}$  W. The northernmost house in the town of Portaferry, kept just open of Bankmore head, N.  $\frac{1}{4}$  E., will lead through East channel and to the east of the Meadows. When Kilclief castle bears W. by N.  $\frac{1}{2}$  N., a vessel will be to the northward of the Meadows, and may haul more to the westward into mid-channel. In light winds care must be taken to guard against the set of the flood tide towards the Meadows.

If Portaferry is concealed by fog or rain, run in with Angus tower bearing N.  $\frac{1}{2}$  W. until abreast Garter perch, and then along the east side of Angus rock at about a cable's distance. Give Ballydock point on the starboard hand a berth of 2 cables, and steer North, keeping midway between the beacons on Cloghy and Gowland rocks; proceed either to the anchorage in Audley or Ballyhenry road, taking care in either case to haul in, in good time, so as not to be carried past them by the flood tide. In going into Ballyhenry road, Walter rock must not be approached too close, on account of the rapid tide stream which sets past it. And in hauling into Audley road care must be taken to avoid Zara shoal.

In approaching lough Strangford from the northward, give Ballyquintin point a berth of at least half a mile, or keep St. Patrick perch in line with the south end of Guns island, W.S.W., until the tower of Ballyculter church comes in line with Kilclief castle, N.W. by N.; run with this mark on until the north house at Portaferry opens of Bankmore head, bearing N.  $\frac{1}{4}$  E. when proceed as before.

With the wind out, there is no difficulty in entering with the flood tide. Stand towards Ballyquintin point with caution, or tack before the west side of the meadow, that is seen to the left of Portaferry, shuts in; standing towards the Rath on the west shore, tack before Ballywhite mill opens of Bankmore head. A vessel may back and fill in, or make short tacks, keeping in the strength of the tide, and taking care to avoid the pladdies along the shore, as well as the eddies and whirlpools.

The navigation is considered quite safe in a commanding breeze, but with light winds great caution is required to keep the vessel in the fairway. In the event of being becalmed, do not attempt to stand in for either shore, but keep in the middle of the channel, and suffer the tide to carry the vessel into lough Strangford, where, when the water shoals to 15 or 16 fathoms, she may anchor; or endeavour to gain the anchorage north of Chapel island, until the returning ebb carries her back to Audley, or Ballyhenry, road. If dropping out in light winds, as the entrance is approached be careful to keep in the fairway of East channel, to avoid being set on the dangers in West channel, or upon Angus rock.

**LOUGH STRANGFORD** covers an extensive area, being about 12 miles long and averaging 3 miles in width. The soundings throughout

are irregular, and the water is deep, 25 to 30 fathoms; there are, however, some sheltered anchorages, with ample room for the largest ships; but the navigation is rendered intricate by numerous shoals called pladdies, some of which uncover, while others never appear. Within the islands on the western shore are many snug creeks and anchorages, where a large number of small vessels may lie in the most perfect security. Very few vessels, and those of the smallest class only, ever frequent the inner waters of the lough. A stranger will best acquaint himself with its intricacies by studying the chart of the lough, No. 2,156.

**Pilots** for the lough may be procured at Portaferry.

If in a small vessel and bound to Kircubbin, when above Limestone rock, which covers on spring tides only, bring Don O'Neil island in line with the east end of Mourne mountains, S.W.  $\frac{3}{4}$  W., and it will lead between Lisbane rock and Long Sheelah, and between Gransha point and the south end of the range of pladdies that cover the eastern shore, but it also leads over a rock with only 10 feet water that is a little northward of Gransha point. Run on this mark until the east end of the trees near Grey abbey comes in line with Black brae, N.N.E.  $\frac{1}{2}$  E. (Grey abbey mill will appear a little westward of the brae), and this will lead between Kircubbin shore and the pladdies off it. A vessel may anchor anywhere on this line of bearing, in from 6 to 12 fathoms, muddy bottom, and have little or no tide stream.

At Kircubbin is a quay, alongside which vessels of 10 feet draught may go at high water. When hauling into Kircubbin bay, give Monaghan bank a good berth, to avoid the shoal that extends 2 cables to the northward of it.

If intending to proceed farther up the lough than Kircubbin or Grey Abbey, a vessel must keep westward of the pladdies, as otherwise it would be difficult for her to find an outlet to the northward of them. On proceeding up the lough, after Round island, on the east shore, has been passed, bring it in line with Ballywhite mill, South, which will lead between Lisbane rock and Long Sheelah, and up the principal channel of the lough until Rig pladdy is approached; Rig pladdy, which is uncovered on spring ebbs, is off Mahee island, nearly in mid-channel, and this mark leads directly on it. Before reaching it, a vessel may haul into White rock bay, or any of the numerous creeks in the vicinity.

There is plenty of water on each side of Rig pladdy, and for a couple of miles above it. But from the entrance of Comber river a chain of pladdies extends across the lough, leaving narrow channels between them, which, in the absence of buoys or leading marks, it would be difficult for a vessel to find. The small vessels that frequent this part navigate only at high water, when they pass over all the dangers, and proceed up Comber river

to Island hill, or discharge where convenient on the sandy flats that surround the head of the lough.

**River Quoile** takes a W.S.W. direction from off Killyleagh towards Downpatrick, small vessels go up with the tide to Quoile quay, about 4 miles above Killyleagh, and within  $1\frac{1}{2}$  miles of Downpatrick, where the navigation ceases. For the first 2 miles of its course, to as far as Hare island, the Quoile has a good depth of water and affords capital anchorage; but beyond this it nearly dries at low water. Abreast Green island there is not more than 5 fathoms water, but both to the east and west of it there are 10 to 8 fathoms.

**Killyleagh** is on the west shore of the lough at the entrance of the Quoile, before it is a little bay that dries at low water, with a stone quay on its east side, alongside which vessels of 10 feet draught may go at high water. Harbour rock, with a stone beacon on its west end, is in front of the bay, and from it a mud flat runs parallel to the shore for nearly a mile to Moore point.

There is excellent anchorage off Killyleagh in from 6 to 10 fathoms, mud; and as far up the river as the west end of Salt island, a distance of  $1\frac{1}{2}$  miles, there is ample room for ships, and perfect shelter against all winds and sea, in from 4 to 9 fathoms water, at about one-third of the distance across from the islands towards the main land.

**Skate Rock.**—The entrance to the Quoile is encumbered with shoals, the largest of these, Skate rock, uncovers at 4 hours ebb, and is marked by a wooden perch on each end. Portaferry mill in line with the north end of Chapel island, S.E.  $\frac{3}{4}$  E., leads northward of it, and the other patches in its vicinity. On this course there is not more than 20 feet water at low water spring tides. When Salt island comes wholly open of Green island, bearing S.W. by S., a vessel will be to the westward of the shoals, and may haul up S.W. by W.  $\frac{1}{2}$  W. for a berth in the river, remembering that the deep water is towards the south side of the channel near the islands. Vessels bound to Killyleagh quay will find a boat in attendance near the stone beacon on Harbour rock to render the necessary assistance.

**Barrel Rock**, dry at low water, is more than half a mile to the northward of Skate rock, and northward of the former rock is a deep-water channel into the Quoile. Tara hill, in line with Audley point, S.E.  $\frac{3}{4}$  S., leads north-east of the Barrel, and between it and a patch with 6 feet, in 7 to 10 fathoms water, but it would be necessary to buoy these shoals before large ships could navigate among them with safety. When Salt island comes wholly open, haul up towards it as before.

**The COAST** northward of lough Strangford, to as far as Copeland islands, a distance of 23 miles, consists of a low rocky shore, skirted by dangerous reefs, and backed by a succession of low undulating hills, which



and has 9 and 10 fathoms water at  $1\frac{1}{2}$  cables to the eastward of it. South rock (dis-used) lighthouse, in line with North rock beacon, bearing S.S.W.  $\frac{1}{4}$  W., leads one-third of a mile outside it.

**McCammon Rocks**, covered at high water, are nearly half a mile to the northward of Plough rock, and one-third of a mile from the shore, with 5 fathoms water within one cable of them. During the herring season, the boats engaged in the fishery find partial shelter behind these rocks.

**Burial Island**, the highest part of a reef of rocks off Ballyhalbert point, extends nearly half a mile in a N. by E.  $\frac{3}{4}$  E. and S. by W.  $\frac{3}{4}$  W. direction, and is about 2 cables broad. The northern portion of the reef is just awash at high water. The small spot to which the name of Burial island applies is on the inner part of the reef, towards its south end, and is elevated 20 feet above high water. On its north and east sides the reef is steep-to, and clear of danger. A rocky shoal extends one mile to the southward of it, with patches of 13 and 14 feet water on it. The channel between the reef and Ballyhalbert point is contracted by a spit of gravel extending from the latter, to about half a cable in width, and carries a depth of 9 feet at low water.

**Ballyhalbert Bay** is a clean open bay, immediately northward of Burial island, where a vessel may stop a tide, in from 4 to 6 fathoms water, and find good shelter with south-west winds. Anchor off the village, with the Moat bearing West, or W.S.W., and Burial island from S. by E.  $\frac{1}{4}$  E. to S.S.E.  $\frac{1}{4}$  E. When the wind veers to eastward of South it sends a heavy sea in. The bottom is generally hard, but near the moat are some patches of clay.

**Skulmartin Rock**, covered at half-tide, and marked by a conspicuous iron perch painted *red*, lies N.  $\frac{1}{4}$  E. 3 miles from Burial island, and nearly one mile from the shore. It is steep-to on its north and east sides.

A **Bell buoy** is moored off Skulmartin reef, in 20 fathoms, about one mile E.  $\frac{1}{4}$  S. from the perch; with Grey Abbey Stone windmill, in line with Skulmartin perch, W.  $\frac{1}{4}$  N.; Burial island, S.S.W. 3 miles; and Donaghadee lighthouse, N.  $\frac{3}{4}$  W.  $7\frac{1}{4}$  miles.

Little Skulmartin reef extends from the shore towards Skulmartin rock, in an E.N.E. direction, leaving a narrow passage between them, with from 3 to 4 fathoms water. None but persons well acquainted with the coast should venture within Skulmartin rock. The perch and bell buoy sufficiently mark the position of the rock, but, should they be gone, by keeping South rock (dis-used) lighthouse open of Burial island, a vessel will pass well outside it. At night, Donaghadee *white* light becomes obscured on a N.  $\frac{1}{4}$  W. bearing about half a mile eastward of the rock.

**Nelson Rock**, with 7 feet water, lies half a mile to the northward of Skulmartin. The passage to Ballywalter quay is between them.

**Ballywalter Quay.**—Ballywalter village stretches along the shore within Skulmartin rock. Near its south end is a substantial quay, built on a ledge of rocks, and sheltering a small sandy bay; there is from 7 to 10 feet alongside the quay at high water. South-easterly gales send in a heavy ground swell. There is convenient anchorage for vessels waiting for tide to go in to the quay, anywhere between it and Skulmartin rock, in from 3 to 5 fathoms, sandy bottom.

**Life-boat.**—A life-boat is stationed at Ballywalter.

**Long Rock**, three-quarters of a mile northward of Skulmartin rock, and barely covered at high tides, is the commencement of a series of rocks that lie along the shore for a distance of nearly 2 miles, terminating in a shoal called the Reef; on the north end of which, and nearly three-quarters of a mile from Ballyferris point, is Ship rock, with 2 feet water, and 5 fathoms close outside it. The outer margin of these rocks has a N. by E.  $\frac{1}{4}$  E. direction from Long rock, and is steep-to; at half a mile distant from it there is 15 fathoms, and at one mile, 20 fathoms water. Skulmartin perch, in line with Ballyhalbert point, S. by W., leads about 2 cables outside Long rock, and one cable outside Ship rock.

**Burges Rocks.**—From Ballyferris point northward to as far as Mill isle, outlying rocks extend to the distance of nearly three-quarters of a mile off; some of these uncover, on others there are from 1 to 2 fathoms at low water. From Mill isle to Donaghadee the rocks do not extend more than one-quarter of a mile off shore, and are steep-to, with 5 fathoms close outside them.

**DONAGHADEE HARBOUR,\*** covering an area of about 7 acres, is formed by a handsome cut stone pier, projecting out on the rocky foreshore at the south side of the bay in front of the town, and is sheltered to the north-west by an insulated pier of similar construction. In 1650 the first quay was built here; before 1744 it was adopted as a packet station, in connexion with port Patrick, 19 miles distant, on the opposite coast of Scotland; and in 1836 the present harbour was constructed. Depth of water sufficient for the packets was gained by excavating a channel along the south pier.

There is 16 feet at low water between the pier heads, gradually shoaling to 11 feet at the warping buoy, and then to 8 feet near the inner end of the south pier. Close to this the rugged fore-shore uncovers. The northern part of the harbour has not been excavated, and has only from 8 to 3 feet water, over a hard bottom. On this side, however, the fore-shore is

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\* See Admiralty plan of Donaghadee harbour, No. 2,549; scale,  $m = 60 \cdot 5$  inches.

a clean sandy beach, which dries out to the inner end of the north pier. The entrance is open to E.N.E., and, although only 150 feet wide, admits the swell so freely that with the wind any way on shore it is either inconvenient or positively unsafe to lie alongside the pier. Vessels moor with a sternfast to the south pier.

Outlying rocks, with from 3 to 10 feet water over them, extend both northward and southward of the entrance, to one cable from the pier heads; those to southward are marked by a *black* cask buoy, lying one cable E.S.E. of the south pier head, which vessels from southward must leave on the port hand in entering. The church tower open of the south pier head, W.  $\frac{1}{4}$  S., southerly, clears the rocks to southward of the harbour. The north house of the parade open of the north pier head, S.W. by S. southerly, clears the rocks to the northward of the harbour.

**LIGHT.**—The lighthouse on the south pier head, painted white, and 53 feet high from base to vane, exhibits at the elevation of 56 feet a *fixed* light, *red* to seaward, when bearing between N.N.W. and S.W., on which latter bearing it leads about 2 cables eastward of the Platters off Copeland island, and *white* between N.N.W. and N.  $\frac{1}{4}$  W., and from S.W. towards the entrance of Belfast lough; it is visible in clear weather at the distance of 12 miles.

Vessels approaching from the southward changing the *red* light to *white* would be running into danger.

**TIDES.**—It is high water, full and change, at Donaghadee, at 11h. 13m.; springs rise  $11\frac{1}{4}$  feet, neaps  $9\frac{1}{4}$  feet.

At the north-west part of the town is a moat surmounted by a turreted building which was erected during the progress of the harbour works for a powder magazine, this, together with the church and lighthouse, are the most prominent objects in Donaghadee. A railway connecting the town with Belfast and Downpatrick, is led down to the quay, where vessels can discharge their cargoes into wagons by means of cranes each equal to a lift of five tons. The embroidery of muslin employs some of the inhabitants, but the town has little trade. Population in 1871, 2,225.

**Rigg Bank**, with 8 fathoms water, lies abreast Donaghadee  $2\frac{1}{2}$  miles from the shore, with Copeland lighthouse N. by W. 4 miles distant; its position is generally shown by the rippings over it; there are from 18 to 23 fathoms around it.

Off Foreland point, three-quarters of a mile to the northward of Donaghadee lighthouse, the rocks uncover to 2 cables from the shore, and are marked by a conspicuous iron perch, beyond which there are rocky patches with from 7 to 13 feet water. The Governor buoy, *black* cone, lying in 18 feet E.  $\frac{1}{4}$  S. 2 cables from the perch, marks the outer edge of these dangers. Standing towards the shore, between the buoy and

Donaghadee, by night, keep the *red* light in sight ; by day, keep the lighthouse to westward of a S. by W.  $\frac{3}{4}$  W. bearing.

**COPELAND ISLANDS**, on the south side of the entrance to Belfast lough, are of moderate elevation, and distinguished by a lighthouse on the northern island. The channels between them are beset with dangers, and swept by rapid tides.\*

**Copeland Island**, the largest of the group, forms the eastern side of Donaghadee sound, and is nearly one mile long, half a mile broad, and 109 feet high. Foul ground extends nearly half a mile from its south-west side towards the main, contracting the channel through the sound to a quarter of a mile in width. Deputy reef, with 9 feet water, marked by a *red* buoy, is nearly in the middle of the fairway.

**Platters and Ninaen Bushes**, two rocky shoals, extend from the north-east point of Copeland island to the distance of half a mile; the latter, with 3 feet water, is marked by a *red* can buoy, moored one cable to the north-east of it in 8 fathoms water. A bank with  $3\frac{1}{2}$  fathoms projects off nearly 4 cables from the north point of the island.

**Lighthouse Island** is three-quarters of a mile to the north-east of Copeland island, with Mew island close to the eastward of it; the former is 90 feet high, but the latter is low and washed by the sea in easterly gales. There is a boat channel between them. Gillet, with 9 feet water, is one quarter of a mile southward of Mew island. On other parts, both the latter and Lighthouse island are clear of danger.

**COPELAND LIGHT**.—A *fixed white* light is exhibited on Lighthouse island from a white tower 52 feet high, at an elevation of 131 feet above high water, visible in clear weather at the distance of 16 miles. A bell is sounded in foggy weather.

**TIDAL STREAMS**.—It is high water, full and change, at South rock, at 10 h. 58 m.; springs rise 13 feet, neaps  $10\frac{3}{4}$  feet. At Donaghadee, at 11 h. 13 m.; springs rise  $11\frac{1}{4}$  feet, neaps  $9\frac{1}{2}$  feet. From the entrance of Strangford lough, through the inner passage, the stream is comparatively feeble, not averaging more than  $1\frac{1}{2}$  knots on springs. It turns 20 minutes before the time of high and low water on the shore, or about the same time as the channel stream, setting parallel to the shore. Between North and South rocks it sets E.N.E. and W.S.W.

Outside South rock the flood stream sets across the Ridge, nearly due South; the ebb shoots out in an E. by N. direction at the rate of 2 knots.

Within Skulmartin the stream turns one hour before high and low

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\* See Admiralty plan of Belfast lough, No. 1,753; scale,  $m = 2\cdot2$  inches: also, plan on chart of Irish channel, sheet 1, No. 1,825a.

[illegible]

While beyond the distance of half a mile southward of Donaghadee light, a vessel may stand in until it changes from *red* to *white*. Standing in to the northward of the harbour, between it and Foreland point, tack before the light changes colour.

Vessels proceeding through the sound between Copeland island and the main, sometimes called the sound of Donaghadee, should endeavour to pass between Deputy and Governor buoys. The course through is N.N.W.  $\frac{1}{2}$  W. In the fairway there are from 4 to 5 fathoms water, but there are no marks to guide a vessel in the best water. On the flats extending from the main there is as little as 16 feet near mid-channel.

The Bush, a high rock standing off the west point of Copeland island, in line with Black head on the north shore of Belfast lough, bearing N. by W.  $\frac{1}{2}$  W., leads eastward of Deputy reef, and clears Slaty reef extending from the south-west point of the island; but as this mark would lead over a patch of  $1\frac{1}{2}$  fathoms off the latter reef, haul more to the westward when Horse point bears E.  $\frac{3}{4}$  N. The Bush is foul to the distance of 2 cables, and must not be approached within that limit. If working through, stand towards both shores with caution, making short tacks near mid-channel. The navigation is quite safe with an experienced pilot, but strangers should not attempt the sound without a leading wind and tide.

With northerly winds, vessels bound into Belfast lough find it advantageous to pass through the sound between Copeland and Lighthouse islands, as the tide makes to the northward there at half-flood by the shore. While standing to the north-east for this purpose, give the south-east end of Copeland island a good berth, and the Platters and Ninaen Bushes to the north-east of the island will be cleared by keeping a gap in the trees to the north-west of Donaghadee open to the south-eastward of the island, S.W. by W. (see view on chart 1,753). The Moat, at Donaghadee, open of the same will also clear Ninaen Bushes, but leads over the Platters; pass to the eastward of the *red* buoy on the Bushes, and when Black head comes in line with the south-west side of Lighthouse island, N.N.W.  $\frac{1}{2}$  W., a vessel will be to the eastward of them, and may haul up N.W.  $\frac{1}{2}$  W., on which course she will carry from 6 to 8 fathoms water through the sound. The last-mentioned mark will also clear Gillet rock. At night, or in thick weather, the Copelands should not be approached nearer than the depth of 30 fathoms, and as the tide streams and eddies are very strong, a vessel should make sure that she is outside the drift of Mew island.

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## CHAPTER VI.

EAST AND NORTH COASTS OF IRELAND.—BELFAST LOUGH TO  
MALIN HEAD.

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VARIATION in 1877.

Belfast 23° 5' W., Inishtrahull Island 24° 10' W., decreasing 9 minutes annually.

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**BELFAST LOUGH.\*** — Immediately on rounding Copeland islands, Belfast lough opens into view. Its entrance, between Orlock point on the south, and Black head on the north, is  $6\frac{1}{4}$  miles wide, and from a line joining these points to Holywood lighthouse it is about  $9\frac{1}{2}$  miles deep, with moderate depths of water and good holding-ground throughout.

Being easy of access, and with moderate caution free from danger, it affords an excellent port of refuge to vessels navigating the Irish channel. Even in the event of a vessel running in dismasted, and without anchors and cables, she might with confidence run on the banks at the head of the lough, where she would make a dock for herself, and remain in safety until fine weather.

The shores of the lough are backed by ranges of lofty hills. Helens tower, crowning the summit of a hill in Lord Dufferin's demesne, is conspicuous from seaward. Divis mountain, at the head of the lough, attains an elevation of 1,800 feet. Cave hill, in the same direction, is remarkable from its jagged outline and precipitous summit.

The depths throughout the lough are moderate, shoaling gradually inwards, from 10 fathoms between the outer heads, to 6 fathoms abreast Grey point, and  $4\frac{1}{2}$  fathoms abreast Carrickfergus bank. When Cultra mill tower comes in line with Cultra quay, not more than  $3\frac{1}{2}$  fathoms will be found right across the lough, and when the mill tower is in line with Marino cottage, not more than  $11\frac{1}{2}$  feet: the bottom is composed of blue mud, chiefly alluvial deposit.

**Pilots** may be obtained at Groomsport, and a cutter, with a black ball on her mainsail, cruises between Grey point and Holywood lighthouse. Compulsory pilotage has been abolished, but the rates are so moderate that

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\* See Admiralty plan of Belfast lough, with views, No. 1,753; scale,  $\frac{1}{2}$  inch = 2.2 inches: also, plan on chart of Irish channel, sheet L, No. 1,825a.

few sailing vessels bound up to the quays take advantage of this regulation. Steam tugs are always in attendance.

**Briggs Rocks**, about one mile N.N.W.  $\frac{1}{2}$  W. from Orlock point, extend a long half mile from the shore; some of them are nearly dry at low water; a *red* buoy placed in 3 fathoms water marks their north extreme. Donaghadee lighthouse, open of Orlock point, S. by E.  $\frac{1}{2}$  E. easterly, leads eastward of the Briggs; and Bangor church spire, open north of Groomsport, W. by S., leads northward of them.

**Groomsport Bay**, on the west side of the reef, is sometimes used as a stopping-place by vessels working either up or down the lough; but Ballyholme bay, one mile to the westward of it, in which there is clean and good anchorage in 5 fathoms, with the wind any way inclining off shore, is to be preferred for that purpose.

**Bangor Bay**, separated from Ballyholme bay by George point, possesses the accommodation of a small pier harbour, dry at low water, and a wooden landing stage for the use of the steam vessels plying to Belfast, with which town it is also connected by rail.

**Life-boat.**—A life-boat is stationed at Groomsport.

**Grey Point**, about 2 miles to the north-west of Bangor bay, is a high bluff point, and clear of danger, with 4 fathoms water close to it, but in the bight to the south-eastward of the point the shore is foul to the distance of 3 cables off, some of the rocks showing at low water. One and half miles to the westward of Grey point, a ledge of rocks stretches off to the distance of one-third of a mile from the shore. A *red* buoy marks their outer edge in 12 feet water; to the westward of this the shore is flat a long way off. Copeland lighthouse, kept open of Grey point, E. by S.  $\frac{1}{2}$  S., clears these flats.

**Oyster Bank**, with 8 feet water, is a portion of the great flat that stretches quite across the lough from Holywood bank in the direction of White abbey, with not more than 11 feet water on any part of it.

A *red* cone buoy is placed on the western side of Oyster bank, in 12 feet water. Cultra mill tower in line with Farm hill house, S.S.E.  $\frac{3}{4}$  E., leads eastward of the bank in 11 or 12 feet water; and Mac Arts fort, just open to the northward of the steam chimney, W.  $\frac{3}{4}$  N., leads northward of it, as does also Copeland lighthouse kept open of Grey point.

**Black Head**, the north point of entrance to the lough, is  $6\frac{3}{4}$  miles N. by W. from Orlock point, and steep-to. It is composed of black basaltic rocks, and presents a nearly perpendicular cliff 430 feet high, with a rounded knob on its summit, which, although not observable from the sea, on account of the land behind it being of much greater altitude, appears conspicuously from the upper part of the lough.



The first of these is the Black River, which flows from the north-northwest to the south-southeast, and is the largest of the three. It is about 10 miles long, and its mouth is at the junction of the Black River and the Black River. The second is the Black River, which flows from the north-northwest to the south-southeast, and is the largest of the three. It is about 10 miles long, and its mouth is at the junction of the Black River and the Black River. The third is the Black River, which flows from the north-northwest to the south-southeast, and is the largest of the three. It is about 10 miles long, and its mouth is at the junction of the Black River and the Black River.

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The sixth of these is the Black River, which flows from the north-northwest to the south-southeast, and is the largest of the three. It is about 10 miles long, and its mouth is at the junction of the Black River and the Black River.

The seventh of these is the Black River, which flows from the north-northwest to the south-southeast, and is the largest of the three. It is about 10 miles long, and its mouth is at the junction of the Black River and the Black River.

The eighth of these is the Black River, which flows from the north-northwest to the south-southeast, and is the largest of the three. It is about 10 miles long, and its mouth is at the junction of the Black River and the Black River. The ninth of these is the Black River, which flows from the north-northwest to the south-southeast, and is the largest of the three. It is about 10 miles long, and its mouth is at the junction of the Black River and the Black River. The tenth of these is the Black River, which flows from the north-northwest to the south-southeast, and is the largest of the three. It is about 10 miles long, and its mouth is at the junction of the Black River and the Black River.

**HOLYWOOD LIGHT.**—A screw pile lighthouse on the elbow of Holywood bank, in 8 feet water, marks the entrance to Belfast harbour. It exhibits an *intermittent white* light at irregular intervals, at an elevation of 27 feet, visible in clear weather at the distance of 5 miles. The lighthouse is also used as a station for the river pilots. A bell is tolled in foggy weather.

**Anchorage.**—Vessels seeking shelter in Belfast lough must be guided in their choice of a berth by their draught of water, but the farther up they can go, the easier will be the riding in easterly gales. Large vessels usually anchor between Grey point and Carrickfergus, near the middle of the lough, from half a mile to  $1\frac{1}{2}$  miles from the south shore, in 5 to  $5\frac{1}{2}$  fathoms water, and find it an excellent anchorage. Men-of-war should not go farther in than to bring Black head in line with White head, and Grey point bearing S.  $\frac{1}{4}$  E.,  $1\frac{1}{4}$  miles distant, when they will have  $5\frac{1}{2}$  or 6 fathoms water. With Carrickfergus castle and church in line, and one mile from the south shore, there is 5 fathoms water, and the same depth will be found for one mile to the westward of this spot, with good holding-ground.

Vessels of light draught anchor to the eastward of Carrickfergus bank in  $2\frac{1}{2}$  fathoms at low water, about three-quarters of a mile from the pier, with Carrickfergus castle and church in line, bearing N. by W. This is a rather exposed anchorage in winter; it is always better, unless bound to Carrickfergus, to run farther up to Whitehouse road, where vessels may anchor in about  $2\frac{1}{2}$  fathoms, with Holywood bank lighthouse bearing from South to E. by S., from one quarter to half a mile distant, and ride securely in all winds. There is also good anchorage for small vessels in Folly road, about one mile westward of Carrickfergus bank; or near the north shore, abreast Seapark house, in  $2\frac{1}{2}$  and 3 fathoms, mud and clay, with Carrickfergus castle in line with Castle Dobbs.

**TIDES.**—It is high water, full and change, at Belfast, at 10h. 43m.; springs rise  $9\frac{1}{2}$  feet, neaps 8 feet.

The main body of the outer stream, both ebb and flood, crosses the mouth of the lough in a curve from Copeland islands to Black head, and near the islands gains a strength of 5 knots; this curve bends more and more in until it stretches from White head to Grey point, where it divides, one part of the flood running up to Garmoyle, the other bending back and running towards Orlock, and near that place will carry a vessel upon the Briggs, if not guarded against. The stream in the lough seldom exceeds one knot in strength; in the New cut the flood is scarcely perceptible, but the ebb sometimes runs  $1\frac{3}{4}$  to 2 knots.

**Directions.**—Vessels may run boldly for Belfast lough by night or by day. If seeking shelter from south-west gales, they may bring up anywhere to the westward of Ballyholme bay, at the distance of half a

mile from the shore, but the anchorage above Grey point is the most secure. Working along the south shore, tack at any convenient distance, being careful to avoid the Briggs, and the ledges on the east side of Grey point. When to the westward of Grey point, tack in 4 fathoms, till 2 miles above it, then in  $3\frac{1}{2}$  and 3 fathoms, and when opposite Cultra quay in  $2\frac{1}{2}$  fathoms. Copeland lighthouse, in line with Grey point, E. by S.  $\frac{1}{4}$  S., clears the foul ground on this shore, and leads northward of Oyster bank.

Standing towards the north shore, be careful of the North Briggs, which will be cleared by keeping Black head open of White head, bearing N.E.  $\frac{1}{4}$  E. northerly: or Carrickfergus castle showing over Kilroot point, W.  $\frac{1}{4}$  N. (see view chart 1,753). Having passed them, stand in to 4 fathoms until above Carrickfergus bank, when the shore may be approached by the lead to any convenient depth.

Should the wind come round eastward, vessels at anchor in the outer part of the lough may run for the inner anchorages of Whitehouse or Garmoye roads, where they will ride in safety. Gales from West and W.N.W. blow out of the lough with great violence.

**Belfast Harbour.**—The limits of the harbour are from Grey point on the south side and Carrickfergus on the north to the first weir across the river Lagan above Queen bridge, a distance of  $8\frac{1}{2}$  miles; and it is bounded on either side above Holywood by extensive slob lands, which are covered at high water. So shallow was the upper portion of the harbour before the new cut was made, that vessels drawing more than 10 feet water were unable to go up to the quays on neap tides. With a greatly increasing traffic, the inconvenience attending this became so pressing, that in 1839 works for improving the port were commenced by deepening the existing channel of the river from Garmoye to Seal channel, and making a new straight channel from that point to the town, which, after some delay, was completed in 1849. Steam-vessels drawing 10 feet water now leave the quays at all times of the tide.

From Queen bridge the river Lagan is navigable for barges up to the first lock of the Lagan Navigation Company. From thence, Lagan canal connects lough Neagh with Belfast harbour by an inland navigation of 28 miles in length. The communication is then continued through lough Neagh to Ulster canal, which connects the navigations of that lough with those of lough Erne.

**BELFAST** is the nucleus of the Irish linen manufacture, and has a number of spinning mills and power loom factories. There are also iron foundries, shipbuilding yards, and yards for manufacturing rope and sail-cloth. The custom-house, a new building containing an extensive range of offices, for the customs, inland revenue, post-office, and shipping office is on Douglas quay; and the harbour office, a handsome building, stands close

to Clarendon dock. There is also a sailors' home, and sailors' institute. Supplies are abundant. Vessels can be provided with water led down to the quays; and coal, fit for steamers, can be purchased. In 1875, the arrivals were, coastwise, 6,912 vessels = 1,277,165 tons; foreign, 457 = 184,348 tons. Sailings, coastwise, 6,280 vessels = 1,255,372 tons; foreign, 216 = 95,525 tons. The tonnage belonging to the port consisted of 20 steam-vessels, of 2,834 tons; and 373 sailing vessels of 62,180 tons. Population in 1871, 175,000. Belfast communicates by rail with all the principal towns, and branches of the different railways are led down to the quays.

**Docks.**—There are three tidal docks, namely :—

	Area.			Width of entrance.	Depth at high water of ordinary springs.
Prince dock	-	3a.	3r. 18p.	45 feet.	16 to 18 feet
Clarendon „	-	3	3 10	65 „	12 „ 14 „
Spencer „	-	7	2 0	80 „	21 „ 23 „

Dufferin floating dock of 3a. 1r. 2p. area is entered from Spencer dock.

There are three graving docks of the following dimensions :—

Length.	Width of entrance.	Depth over sill at high water ordinary springs.
460 feet.	60 feet.	16 feet.
273 „	34½ „	11 „
234 „	29 „	9 „

Also two patent slips, one of which is capable of receiving a vessel of 1,000 tons.

The river quays, measuring 7,000 feet, is amply provided with sheds, and cranes, one of which is equal to a lift of 50 tons; besides which seven steam cranes of 2 to 4 tons each have recently been erected, as well as steam sheer legs for masting vessels, or lifting machinery up to 50 tons weight.

There is every facility for the repair of ships in wood or iron, and foundries where engines can be repaired.

At the entrance to the harbour, on the west side of Holywood lighthouse, is a bar, through which a channel has been dredged to a depth of 11 feet at low water. After passing it, the water at once deepens to 18 and 21 feet in Garmoyle road, which extends about one mile in the direction of S. by W.  $\frac{3}{4}$  W. and S.W.  $\frac{1}{4}$  W., and is 600 feet wide. From the head of Garmoyle, after passing the second lighthouse, the channel bends round to W.  $\frac{3}{4}$  N., and then W. by S.  $\frac{1}{4}$  S. for the entrance of the new cut, whence its course is direct up to the town.

**LIGHTS.**—One mile to the south-west of Holywood *intermittent white* light, there is a pile lighthouse showing a *fixed green* light, succeeded by two more *green* lights towards Belfast, all of which must be left on the port hand going up. There is also a pile lighthouse, from which is

exhibited a *fixed red* light, on West bank, nearly half a mile to the westward of the beacon on the north side of the channel, to be left on the starboard hand going to Belfast.

Besides the lighthouses, the channel is further defined by the following buoys and beacon; there is a large cone buoy, *striped horizontally red and black*, on Middle bank, in 5 feet water; and two large *black* cone buoys, and a beacon on the eastern projection of West bank; all these are to be left on the starboard hand going up. On the Hollywood side of the channel is a *red* cone buoy about one-third of a mile above the beacon, to be left on the port hand going up. To proceed up to the town a fair wind or the assistance of steam is necessary, but a stranger should not attempt the passage without a pilot.

**MAGEE ISLAND.**—From Black head the peninsula or island of Magee extends northward for six miles, its slightly insular character being due to a small stream which connects Belfast and Larne loughs; the elevations vary from 476 feet behind Black head to 230 feet near the north end, which terminates in the low points of Skeenaghan, Barr, and Farres, the last-named, forming the eastern point of the entrance to lough Larne, being marked by a lighthouse. The perpendicular cliffs on the eastern side of Magee island consist of black basalt, and at the Gobbins are 150 feet in height, with deep water close to.\*

**Muck Island**, 5 miles northward of Black head, is connected to the shore by a narrow neck of shingle beach; on either side of which small vessels may stop a tide; the east or sea face of the island presents a perpendicular cliff. On rounding Muck island, and steering N.W.  $\frac{3}{4}$  N. for 3 miles, the little harbour of lough Larne will come into view.

**HUNTER ROCK**, with 10 feet water, is N.  $\frac{1}{4}$  W.  $2\frac{1}{4}$  miles from Muck island, and S.W.  $\frac{1}{3}$  S., nearly 3 miles from the south-east light on the Maidens, with Larne lighthouse just open of Barr point, and in line with Olderfleet castle, bearing S.W. by W.  $\frac{1}{3}$  W. It is steep-to all round, with from 10 to 20 fathoms within a cable's distance, and is marked by a *black* buoy, which, however, is frequently washed away. The Gobbins seen outside Muck island leads 4 cables eastward of the rock; Scawt mountain, in one with Ballygalley head, N.W.  $\frac{1}{2}$  W., (view C. chart 1,237) leads about two cables north-east of it; and when Larne lighthouse is shut in by Barr point, a vessel will be to the southward of it. There is a clear channel between the rock and the shore, with from 15 to 24 fathoms water, which is frequently used by steam ships as well as by sailing vessels under favourable circumstances of wind and weather, but great care is necessary in taking the passage by night. See remarks on tidal streams, page 162.

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\* See Admiralty chart, Ireland, sheet III., Larne to Bloody foreland, No. 46; scale, m = 0.5 inch.

**LOUGH LARNE**,\* an excellent harbour for coasters and small vessels, presents a large surface at high water, but is so encumbered with mud banks that it affords but limited anchorage. The entrance, with from  $3\frac{1}{2}$  to 4 fathoms water, is only 200 yards wide.

The town of Larne, at the head of the bight, on the west side of the Curran, has a limited trade, it imports coal and foreign grain, and the largest shipments are of lime and limestone from the extensive works at Ballylig, 3 miles southward of the town. A railway connects Larne with Belfast, and another line to Ballymena and Ballyclare is in course of construction. State line steam-ships from Glasgow to New York call every outward voyage to embark passengers and goods; there is also a daily steam service to and from Stranraer in connexion with the railways on either side. Provisions and other necessary supplies can be obtained. In 1875, the returns for the port, which is a creek of Belfast, were: arrivals, coastwise, 1,272 vessels = 142,656 tons; foreign, 17 = 6,005 tons. Sailings, coastwise, 1,363 = 152,498 tons; foreign, 4 = 1,495 tons. Population in 1871, 2,761.

The east side of the lough has a gravelly fore-shore, which, about 3 cables southward of the lighthouse, dries fully a cable off. Southward of this the east shore is clear of danger, and the deep-water channel, about one cable in width, and with from 12 to 23 feet water, runs close along it for 2 miles to Carnspindle bay, when it strikes across towards the western shore, and is here only half a cable in width, with from 10 to 11 feet water.

On the west shore of the entrance is a quay, 233 yards in length, with 20 feet water alongside a portion of it. Nearly half a mile farther in, on the Curran, is Olderfleet castle (*ruin*), and the coast-guard station.

**Sandy Point**.—Four cables northward of the quay a bank of gravel and stones extends  $1\frac{1}{2}$  cables from the west shore, with  $2\frac{1}{2}$  fathoms on its outer edge. Olderfleet castle kept open of the (former) salt works, or the coast-guard watch-house open of the quay, bearing S.W.  $\frac{1}{4}$  S. (view A. chart 1,237), will clear it.

**Buoy**.—A *black* conical buoy is moored in 19 feet E.S.E. one cable from low water margin of Sandy point, with Black cave head bearing N. by W.  $\frac{1}{4}$  W.; Barr point, East; Larne lighthouse, S.  $\frac{3}{4}$  E.  $2\frac{1}{4}$  cables; and the outer extreme of Larne pier, S.W.  $\frac{1}{2}$  S., 4 cables.

From the Curran southward, to as far as the lime works, the whole western portion of the lough is occupied by a vast tract of mud, the greater part of which uncovers at low water, confining the navigation to the channel along the eastern shore.

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\* See Admiralty plan of lough Larne, No. 1,237; scale,  $m = 7$  inches: also plan on chart of Irish channel, sheet 1, No. 1,825a.

## CHAPTER

EAST AND NORTH COASTS OF IRE  
MALIN HE

VARIATION in

Belfast  $23^{\circ} 5' \text{ W.}$ , Inishtrahull Island  $24^{\circ} 10'$

**BELFAST LOUGH.\*** — Imm  
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miles deep, with moderate depths of  
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being easy of access, and with modern  
ords an excellent port of refuge to vessels  
en in the event of a vessel running in  
l cables, she might with confidence run  
gh, where she would make a dock for her  
weather.

The shores of the lough are backed by a low, rolling country, the summit of a hill in the Lough, crowning the summit of a hill in the Lough, from seaward. Divis mountain, at an elevation of 1,800 feet. Cave hill, in the Lough, in its jagged outline and precipitous summit. The depths throughout the lough are uniform, from 10 fathoms between the outer point, and  $4\frac{1}{2}$  fathoms abreast Carrigrohane tower comes in line with Cultra quay, and runs round right across the lough, and when it reaches the cottage, not more than  $11\frac{1}{2}$  feet: the bottom, chiefly alluvial deposit.

Pilots may be obtained at Groomsport on her mainsail, cruises between Grey port compulsory pilotage has been abolished, but





**Middle Bank**, with 4 to 5 feet water, and one-third mile in length, is about 3 cables to the south-east of Curran point, and opposite the Yellowstone. Almost the coast-guard station, and about midway across the harbour, is a bank with but 9 feet water, and 16 to 20 feet on each side of it.

**Anchorage**.—There is very good anchorage just within the entrance, where wind-bound vessels usually lie: but when blowing hard with a veering tide this is an uneasy berth for a small vessel, particularly with southerly winds. The best anchorage is abreast the Yellowstone, a large mass-covered rock in the shore, nearly three-quarters of a mile within the lighthouse, and one mile distant from the shore, in  $3\frac{1}{2}$  fathoms at low water, where is very little tide, and the most perfect security against all winds and sea.

**LIGHT**.—A white lighthouse on Farer point, on the east side of the harbour, exhibits at an elevation of 42 feet, a fixed light, which is *white*, except between the bearings S.W. by W. and W.S.W., when it shows *red* over Curran rock, and the red extending from Barr point. The white light is visible in clear weather at the distance of 11 miles, and the red light should be seen 4 miles off.\*

**TIDES**.—It is high water, full and change, at Larne, at 10 h. 48 m., and at the Loughs about 2 minutes earlier: springs rise  $6\frac{1}{2}$  feet, neaps  $6\frac{1}{4}$  feet.

**Directions**.—With a fair wind a large square-rigged vessel must tack and fill in, but a small handy vessel may be worked in without difficulty. With a fair wind keep in mid-channel until above the quay on the west shore, then steer east towards the east shore, to avoid the Middle ground: run along the south shore at about a cable's distance, and anchor off the Yellowstone, or farther up if convenient. Vessels without anchors and cables may run in, for when once inside the harbour they may take the ground anywhere in perfect safety. A stranger should not attempt to work in without the assistance of a pilot, who will come off on the usual signal being made.

**The COAST** for the distance of 5 miles to the northward of Larne is bounded by a numerous range of steep rocks attaining an elevation of 1,250 feet, and terminating in Rath head, a conspicuous headland, presenting to the sea a nearly perpendicular cliff 526 feet in height. About  $3\frac{1}{2}$  miles northward of Larne is Ballygalley head, a rounded knob 290 feet above the sea with a steep cliff: its base is fringed by craggy basaltic rocks, on which stands the ruin of the ancient castle of Ballygalley. There is good

\* It is proposed to establish two small lights, one on the north-east end of Curran quay, the other farther in, to assist in leading vessels in clear of all dangers.

anchorage with off-shore winds in the bay to the northward of the head, in 6 fathoms water, 3 or 4 cables off shore, with Ballygalley new castle S.W.  $\frac{3}{4}$  W. The shore to as far as Path head is clear of danger, with 5 to 10 fathoms close to.

**The MAIDENS,\*** 4 miles to the eastward of Ballygalley head, consist of two clusters of rocks, separated from each other by a deep and wide sound.

The highest rocks of the southern cluster, 24 and 30 feet high, are distinguished by two lighthouses with dwelling houses and store-rooms adjoining, forming together conspicuous objects from every point of view.

The western lighthouse rock is clear of danger. The eastern rock is foul for a cable to the northward, and to the southward of it a reef extends for more than half a mile in a S.W.  $\frac{3}{4}$  S. direction. Portions of this reef uncover at low water, and its south-west extreme is marked by a rock that is  $2\frac{1}{2}$  feet above high water. The reef is steep-to; 2 cables eastward of it there is 30 fathoms water, and at the same distance to the south-west of it, 10 fathoms.

The north cluster consists of three small rocks disposed in the form of a triangle, the western or Russel rock is 2 feet above high water, the eastern or Highland rock covers one hour before high water, and the southern or Allen rock covers at high water. Rocky ledges extend both to the northward and south-eastward of Allen rock; the other rocks are steep-to, but a near approach to them will always be attended with danger, particularly towards the period of high water, when from the absence of perches there is nothing to show their position.

At the distance of 4 cables to the south-east of Highland rock, is a rocky knoll with 6 fathoms water over it, and at a similar distance outside the latter is 100 fathoms.

The Maidens are steep-to all round, particularly on their eastern side, where there is a deep gully with from 70 to 100 fathoms within half a mile of the rocks. A ship may sail between the lighthouses and the northern rocks in safety, but it should not be attempted in light winds, as the tides are very strong. To sail outside the rocks, the eastern light should not be brought to the southward of S.W. while within 2 miles of it, or to the northward of N.  $\frac{1}{4}$  W. while within one mile of it.

**LIGHTS.**—Two lighthouses warn the seaman of his approach to this dangerous locality; they bear from each other N.W. by W.  $\frac{1}{4}$  W. and S.E. by E.  $\frac{1}{4}$  E., 800 yards distant, and are both painted *white*, with a broad *red* central belt. Each tower exhibits a *fixed white* light, the

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\* See plan of Maidens, on Admiralty chart, Ireland, sheet III., Larne to Bloody foreland, No. 46.

eastern at an elevation of 95 feet, the western at 82 feet above the sea, visible, respectively, at the distances of 14 and 13 miles in clear weather.

**TIDAL STREAMS.**—Off Muck island the tide streams run from  $3\frac{1}{2}$  to  $4\frac{1}{2}$  knots close in, and occasion a race and heavy breaking sea at the springs; with the ebb tide there is an eddy close in shore, commencing at half-tide, but it does not extend far enough off for sailing vessels to benefit by it with a working wind. With the flood there is a strong eddy under Muck island, which will be found very useful to sailing vessels working along this coast. With a northerly wind they will do well to keep close in shore hereabout, as the strength of the flood strikes off from Muck island in a south-east direction, till it meets the stream which passes the eastern side of the Maidens, when it takes a channel direction. At Hunter rock and the Maidens the stream turns from half an hour to an hour earlier than the channel stream, and is slack for 10 minutes. Springs run 3 knots at the Hunter, and  $3\frac{1}{2}$  to 4 knots at the Maidens. Across White and Brown bays a strong eddy commences at half-ebb, running out to the south-east towards Muck 9 hours. Off Ballygalley head and all along this coast there is an eddy at half-tide, extending to half a mile from the shore.

**The COAST** from Path head northward to as far as Fair head, a distance of 18 miles, presents a remarkably bold outline, being composed for the most part of rugged mountain slopes of a more or less precipitous character, and is free from outlying dangers. The frequent recurrence of white limestone, overlaid by black basalt, forms a peculiar feature of this coast.

**Glenarm Bay**, immediately northward of Path head, affords good anchorage with westerly and north-westerly winds, in 6 fathoms water; but it is exposed to south-easterly winds. At the mouth of a stream near the village is a quay, capable of sheltering one or two small coasters, where limestone is shipped.

**Carnlough Bay** may be considered as part of Glenarm bay, being separated only by a slight projecting curve of the coast, with a rock off it which is always above water. This bay is similar to the former in all points of utility, the anchorage being safe only with north-west and westerly winds. A vessel cannot ride here with the wind blowing strong from between N.N.E., east about, and S.S.E. The village of Carnlough, about 2 miles northward of Glenarm, has a small harbour or dock, which has been excavated to a depth of 8 feet at low water. Large quantities of limestone brought from the quarries on the hills by a tram road are shipped here. At the back of the village the hills rise to over 1,000 feet in height at little more than one mile from the shore.

**Garron Point**, a bold precipitous headland, is nearly 4 miles northward of Carnlough : close within it the shore rises abruptly to the height of 760 feet, and at a short distance inland to 1,170 feet.

**Red Bay**, to the northward of Garron point, has a small pier capable of sheltering 4 or 5 vessels moored in tier in 7 or 8 feet at low water ; but it is subject to a heavy swell in easterly winds. The hills at the back of it rise to upwards of 1,100 feet in height, and are intersected by picturesque valleys running far into the interior. The village of Cushendall is about a mile from the pier.

A small stream empties itself near the village of Waterfoot, a little to the westward of the pier, which boats can enter at half-tide, and obtain good water from springs in the vicinity.

There is very good anchorage in any part of Red bay in from 5 to 10 fathoms water, sandy bottom, but it is quite exposed to north-east and east winds. Small vessels lie off the pier head in 3 fathoms : the depths decrease gradually to the shore. South-west winds blow with great violence down the valleys, coming off in heavy squalls, which must be carefully guarded against by ships working into Red bay.

**Cushendun Bay** is  $3\frac{1}{2}$  miles to the northward of Red bay pier : during fine weather a vessel may stop a tide here in from 5 to 8 fathoms water. Off Waterpark house, on the north side of the bay, the shore is foul to  $2\frac{1}{2}$  cables distance. The south side is clear, and shoals gradually to the shore.

Torcor point,  $2\frac{1}{4}$  miles northward of Cushendun bay, is formed by the base of a rugged mountain slope, which descends sheer down into the sea from a height of 870 feet. Two miles farther to the northward is Tor point, with a coast-guard watch-house on its summit, at an elevation of 220 feet above the sea, and a rock lying off it.

**BENMORE, or FAIR HEAD**, is a remarkably bold headland. The mountain range bordering the coast terminates here in a precipice upwards of 600 feet high ; for 300 feet from its summit it presents a perpendicular cliff, and below that an abrupt slope to the water's edge. It is steep to all round, with from 7 to 20 fathoms at one cable's distance from the rocks. At this noble cliff the shore turns short round to the westward. Near the head are the deserted works of a colliery, and to the westward of it there are several shafts. Iron ore is also raised, but the difficulty of shipment prevents the mines being successfully worked. The ground swell from the Atlantic first begins to be felt here.

These headlands form the north-east extremity of Ireland, and its nearest approach to the opposite coast of Scotland, which is of the same mountainous character. Between Tor point and the Mull of Cantyre, the North channel is scarcely 11 miles wide, with a depth of 77 fathoms,

At 10:00 AM the ship was under way. The wind was light and variable, the sea was smooth. At 11:00 AM the ship was under way. The wind was light and variable, the sea was smooth. At 12:00 PM the ship was under way. The wind was light and variable, the sea was smooth.

At 1:00 PM the ship was under way. The wind was light and variable, the sea was smooth.

At 2:00 PM the ship was under way. The wind was light and variable, the sea was smooth. At 3:00 PM the ship was under way. The wind was light and variable, the sea was smooth. At 4:00 PM the ship was under way. The wind was light and variable, the sea was smooth.

At 5:00 PM the ship was under way. The wind was light and variable, the sea was smooth. At 6:00 PM the ship was under way. The wind was light and variable, the sea was smooth. At 7:00 PM the ship was under way. The wind was light and variable, the sea was smooth. At 8:00 PM the ship was under way. The wind was light and variable, the sea was smooth. At 9:00 PM the ship was under way. The wind was light and variable, the sea was smooth.

The VIAS is a small vessel, 12 tons, built at Glasgow, Scotland. It is a schooner, with a single mast, and is used for carrying passengers and cargo. It is a very good vessel, and is well fitted for service. It is a very good vessel, and is well fitted for service. It is a very good vessel, and is well fitted for service.

Ballycastle Bay is a small bay, situated on the north-west coast of Ireland. It is a very good bay, and is well fitted for service. It is a very good bay, and is well fitted for service. It is a very good bay, and is well fitted for service. It is a very good bay, and is well fitted for service. It is a very good bay, and is well fitted for service.

Carriackavan is a small, dangerous rock, uncovered on last winter tide. It is one-third of a mile E. by N.  $\frac{1}{4}$  N. from Kenbane head,

the nearest point of the shore, and on its outer side is steep-to. A reef extends from Kenbane head one-third of the distance across to the rock. No vessel should ever attempt to pass between them. Benbane head, kept open of Sheep island, N.W. by W.  $\frac{3}{4}$  W., leads nearly a mile northward of Carrickavaan.

By night a stream of *red* light is shown in the direction of the rock, from Rathlin island lighthouse. The tide from the south end of Rathlin island sets directly towards it; both streams rush past it with great force, creating a strong eddy under its lee, which sailing vessels must be very careful not to get entangled in.

**Carrickarede**, a rocky islet  $1\frac{1}{2}$  miles westward of Kenbane, is connected with the adjacent cliffs of the mainland by a rude suspension bridge thrown across the narrow strait, for the convenience of the people engaged in the salmon fishery. Here the cliffs attain the height of 460 feet, and expose white limestone underlying trap.

**Sheep Island**, a small precipitous islet of basaltic rock at the western end of Rathlin sound, stands conspicuously out from the white cliffs of Larrybane head. On its north and east sides are some detached rocks, which are steep to. A reef extends from it towards the shore.

**RATHLIN ISLAND**, opposite Ballycastle bay, is composed of high table-lands of 450 feet elevation, surrounded by precipitous cliffs of trap and white limestone, analogous in appearance and geological structure to the opposite shore of the mainland. The southern portion, extending about  $2\frac{1}{2}$  miles in a S.W. by S. direction, is broken into hummocks, gradually declining in height towards the Rue, a low rocky point N. by W.  $\frac{1}{2}$  W.  $2\frac{1}{4}$  miles distant from Fair head.

The shores of Rathlin are clear of hidden dangers beyond the distance of 2 cables. On the western portion of the north coast there is 100 fathoms water at 2 cables from the shore. Off Altacarry head is a tide-race that must be avoided by small vessels; and about one mile south-west of Rue point is a dangerous race called Slough-na-more.

**Church Bay**, in the bight formed by the south-west shores of the island, affords good summer anchorage with the wind anywhere from northward or eastward; the depth of water is moderate, and the holding-ground good. A small vessel may anchor in 6 fathoms, with the church tower on with the east end of the school-house, N.E.  $\frac{3}{4}$  N., or at any convenient distance from the shore, having room to get under way should the wind come to the westward, for the bay is quite exposed to winds from that direction, and to the heavy ground swell that accompanies them. It would therefore be advisable to leave on the first appearance of a change, bearing in mind that the tide stream, which is hardly sensible at the anchorage, sets farther out in the bay for 9 or 10 hours towards the Rue,

and during the first quarter of the ebb only to the westward towards the Bull. There is a good landing-place in the corner of the bay, near the proprietor's house, where water may be procured from springs.

**LIGHTS.**—Altacarry head, the north-east point of Rathlin island, is distinguished by a circular lighthouse, painted *white*, with a *red* belt under the projecting gallery. It exhibits two lights, the upper one, *intermittent*, at 243 feet elevation, shows a *white* light during *fifty seconds*, and is then eclipsed for *ten seconds*, visible in clear weather at the distance of 21 miles, between the bearings S.E., round by south and west, as N.N.E.  $\frac{1}{2}$  E., also in passing through Rathlin sound from N.E. by E.  $\frac{1}{2}$  E. to E.  $\frac{1}{2}$  N., and is coloured *red* on the line of Carrickavaan rock.

During Rags a gun is fired every *fifteen minutes*.

The lower light is *fixed* and *white*, and being placed in the same tower at 100 feet below the upper light, will be seen as a separate light within the distance of 10 miles, between the bearings S.E. by S. and N.N.E.  $\frac{1}{2}$  E., but it is not visible to vessels in Rathlin sound.

**RATHLIN SOUND** is clear of hidden dangers, with the exception of Carrickavaan rock. In gales of wind the overfall of Slough-na-more breaks very heavily, and is dangerous to small vessels. With a commanding breeze there is no danger in the navigation of the sound, but in light winds great vigilance is necessary to avoid being caught in the eddies or overfalls. The water in the fairway is deep, there being from 40 to 60 fathoms over a bottom of rocky and coarse ground. On the island side there is a bank of coarse sand, extending from the Rue nearly 4 miles to the westward, with from 15 to 25 fathoms water over it; its southern edge is marked by a ripple occasioned by the ebb stream meeting the eddy from the Bull.

**TIDAL STREAMS.**—The feature of the greatest importance to the navigation of the sound is the set and velocity of the tide streams. Attaining a high rate on the springs, it is subject to great variations both in force and direction; as a general rule the ebb does not make with the main stream to the north of the island, but is controlled by the eddies that run along the shore.

It is high water, full and change, in Ballycastle bay, at 6h. 25m.; springs rise 3 feet, neaps 2 feet. In the sound the stream runs from  $6\frac{1}{2}$  knots at springs, to 4 knots at neaps, occasioning strong eddies along the shores, with heavy overfalls off all the headlands.

On each side of Tor point there is an eddy which at half-tide gradually extends from the shore; at the last quarter of the channel flood this eddy goes to the westward through Rathlin sound, causing the ebb stream to make there  $1\frac{1}{2}$  hours sooner than it does to the northward of the island;

by taking advantage of these eddies a ship from the southward may carry 9 hours tide to the westward through Rathlin sound.

To the westward of Fair head all along the south shore of the sound as far as Sheep island, there is an eddy with both streams, commencing at half-tide. Carrickavaan rock lies at the junction of the eddy and true streams.

During the first hour and half, the ebb stream sets round Rue point into Church bay, but after high water at Liverpool, when the general stream north of the island has made to the westward, and it has attained a rate of  $6\frac{1}{2}$  knots through the sound, an eddy begins in Church bay, setting from Bull point towards the Rue, and meeting the true tide about one mile to the westward of the latter, where the bottom is very irregular, causes the great overfall called Slough-na-more.

The eddy from Church bay has now forced the main stream into a more southerly course, and with contracted limits it sets from Rue point towards Carrickavaan rock, whence it shoots off in a N.W. direction towards Bull point at the west end of Rathlin, meeting there the stream from the north side of the island setting to the S.W.

The flood or eastern stream does not begin in the middle of the sound until it is low water at Liverpool, although, as before observed, the eddy along the south shore commences at half-tide. There is no slack water preceding the flood stream; in the eastern part of the sound at low water it sets South  $2\frac{1}{2}$  knots, in the western part at the same moment it sets North  $1\frac{3}{4}$  knots, eddying round at each station in opposite directions. The stream soon becomes general, setting fairly through the sound, and rushing out of Church bay past the Rue with great force, including the eddy before alluded to, it sets for 10 hours across Church bay to the eastward. During the flood stream there is an eddy extending  $2\frac{1}{2}$  miles to the eastward of the island, and setting back on it; at the junction of the eddy and true streams there are great overfalls off Altacarry head, and again off the Rue as mentioned above.

**The COAST** westward of Sheep island to as far as the entrance of lough Foyle, is composed of a rugged broken shore, on which black basaltic rocks are the predominant feature; there are some outlying rocks, but no hidden dangers beyond a cable's distance, and the whole shore is subject to a heavy surf, which makes landing difficult, even in the finest weather.

**Ballintoy Point**, half a mile west of Sheep island, with a coast-guard station on its summit, and a little within it the church and village of Ballintoy, has some straggling rocks off it, which may be cleared by keeping Fair head well open of the rocks north of Sheep island.

**White Park Bay** is one and half mile to the westward of Sheep island. Otter rock, with 12 feet water, is at the west end of the bay, with the ruins of an old church near the shore, bearing S.S.W.,  $2\frac{1}{2}$  cables distant.



Roe point kept open of Sheep island, E. by S.  $\frac{1}{4}$  S., will lead 2 cables northward of it.

The soundings in White park bay decrease gradually towards the shore; at half a mile distant there is 10 fathoms over a sandy bottom. Vessels may stop a tide here, but the bay is subject to a heavy swell, and there is always a surf on the beach. In front of the bay is a sand-bank with 8 fathoms water, and there are 13 to 15 fathoms between it and the shore. The east end of the bank, in 10 fathoms, is N. by E.  $\frac{1}{4}$  E.  $\frac{3}{4}$  mile from Ballintoy point, whence it extends N.W. by W.  $\frac{1}{4}$  W. one and half mile. In north-west gales, or when there is much swell, the sea breaks on it. In calms or light winds it is a convenient place to stop for a tide.

**The GIANTS CAUSEWAY** is  $1\frac{1}{2}$  miles to the westward of Bengore head. The coast in its vicinity, composed of stratified cliffs of columnar basalt, rising almost perpendicularly from the sea to the height of 395 feet, has a remarkably bold appearance. At Pleaskin, the loftiest of these, the natural basaltic rock lies about 12 feet under the surface, and is formed into ranges of vertical columns 60 feet in height: this colonnade rests upon a bed of coarse black rock, below which is a second range of pillars, 45 feet high, resting on a bed of red ochreous stone; forming together a perpendicular height of about 154 feet; and from the base of this precipice, a sloping bank is continued to the sea, strewn with débris, and clothed with verdure. In the semicircular bays about the heads the magnetic needle suffers much disturbance.

The causeway consists of a low platform of columnar basalt, projecting into the sea about 700 feet from the base of the cliffs. It is a feature of more interest to the tourist, for whose guidance it has often been described, than to the seaman, who, at the distance from which he views it, can see nothing but an iron-bound coast, fringed by a heavy surf, forbidding his near approach. The shore round the heads is free from outlying dangers, and steep-to. Half a mile off the heads there is 25 fathoms water, and at  $1\frac{1}{2}$  miles 80 fathoms on a rocky irregular bottom, which occasions several overfalls.

Two miles westward of Benbane head, and lying near the shore, is a small detached rock, called the Mile-stone; at this point the causeway heads terminate, and the shore falls back into Bushmills bay.

**Port Ballintrae**, a little creek at the west end of Bushmills bay, and near to the outlet of the river Bush, affords no shelter, as the heavy Atlantic swell rolls directly into it. One mile to the westward of port Ballintrae, on the summit of a cliff overhanging the sea, is the ruin of Dunluce castle; the approach to it is by a narrow causeway over a stone bridge: underneath the castle is one of the beautiful caverns that abound on this coast.

White rocks (of white limestone) succeed the black trap rocks half a mile to the westward of Dunluce castle, from whence they extend along the shore for three-quarters of a mile, and are followed by a range of sand-hills to port Rush. The whole shore is free from danger, with the exception of Skirk rocks, and may be approached with ordinary caution.

**SKIRK ROCKS**, awash at high water, and marked by a stone beacon, surmounted by a ball, 35 feet high, are more than half a mile N.  $\frac{3}{4}$  W. from Dunluce castle, and S.E. by E. rather more than one mile from Great Skerrie island. On the north side they are steep, with 10 fathoms close to; southward and eastward, foul ground extends  $1\frac{1}{2}$  cables from them, while between them and the shore is a clear channel with from 11 to 14 fathoms water.

**The SKERRIES**,\* W.  $\frac{1}{2}$  N. 5 miles from Benbane head, and one mile from the nearest shore, form a chain of low rocky islets, extending from Black rock at their east end  $1\frac{1}{2}$  miles in a westerly direction, and are free from outlying dangers. Great Skerrie is 4 cables long, one cable wide, and 82 feet high; Little Skerrie is about one cable across and 59 feet high: they afford pasture to a few sheep in summer. The smaller rocks are washed by the sea, and in north-west gales the spray flies over them all. Carr rocks, uncovered at half-tide, and always known by the break on them, are at the west extreme of the Skerries, and N.E.  $\frac{1}{2}$  N.  $2\frac{1}{2}$  cables nearly, from Ramore head.

**Skerries Sound**, between Carr rocks and Ramore head, is clear of danger, with a depth of 8 fathoms water. Benbane head seen over the east end of Great Skerrie, E.  $\frac{1}{2}$  S., leads through Skerries sound. Steam-vessels usually go through it for the purpose of calling at port Rush. Great caution is required in so narrow a channel, where a heavy sea generally prevails. The tide sets fairly through it.

**Broad Sound**, the passage between Little Skerrie and the western group of rocks, is  $2\frac{1}{2}$  cables wide, with depths of 12 and 14 fathoms. The tide sets strongly across it.

**Anchorage**.—Skerries road affords a safe summer anchorage under the shelter of Great Skerrie, at the distance of from one to 2 cables from it, in 6 or 7 fathoms, sand and stones. There are mooring-rings in the rocks to assist the anchors in north-west gales, when a good deal of sea rolls in. Large ships lie more to the southward, in 7 or 8 fathoms; but the nearer to the island the better shelter they will find in north-west gales. When coming into the road from the eastward, a cleft through the middle of Great Skerrie will be seen to open, and as soon as it begins to close again, a vessel will be in a good berth. In passing Black rock give

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\* See Admiralty plan of Skerries roadstead, No. 49; scale,  $m = 3.3$  inches.

is a mark if there is any swell in the sea when breaks heavily to some distance seaward. Boats would should not be taken without a commanding view.

**PORT RUSH**, a little pier harbour in the western side of Ramore head, entrance in area of about 2 miles in extent. A bank of sand has grown in immediately within the entrance, with but 7 feet over it at low water, and the whole harbour is fast filling up: there is still, however, from 15 to 20 feet water close to the north pier. In north-west gales the sea breaks right across the entrance, and there is a heavy run in the harbour.

Although so inconveniently circumstanced with respect to its entrance, and the heavy run it is subject to, port Rush is valuable as affording an outlet for the produce of the country, and is besides the port of Coleraine, with which it is connected by railway. Cross-channel steam-vessels from and to Lerry sail here.

Port Rush may be approached gradually towards the strand; at the west side of it is Rock Don, lying one cable from the shore, and about one cable to the west of it is the Mount, a half-tide rock.

**Life-boat.**—A life-boat is stationed at port Rush.

The coast to the westward is rocky and clear of danger until within half a mile of port Stewart point, where is a half-tide rock called Lawson rock, rather less than a cable from the shore: by not coming within half a mile of the shore a vessel will keep clear of all danger.

The village of port Stewart, extending along the shore to southward of the point, has a cheerful appearance from the sea, and is much resorted to for sea bathing. On the west side of the point is a little creek excavated in the rocky shore for the convenience of the fishermen; some experience, however, is required to effect a safe landing, even in fine weather. From port Stewart point the rocky shore falls back to the S.S.W. for about one mile, and is then succeeded by a range of sand-hills to the entrance of the river Bann,  $4\frac{1}{2}$  miles to the westward of port Rush.

**RIVER BANN** is obstructed by a bar of shifting sand at its entrance, with 4 feet over it at low water, and 10 feet at high water springs, and such a heavy surf that it is only after a continuance of fine weather the passage across it can be effected. Half a mile within the bar is a bank called the Ford, with a narrow gutter of 5 and 6 feet water round its western edge; on passing this, no further obstacle to the navigation occurs until at Coleraine, where the river is crossed by a bridge.

The river channel preserves a tolerably uniform width of about 200 yards, and the depths vary from 9 to 14 feet. There are two patches of stones in the channel, one on the east side, the other near the middle, but

with deep water on both sides of them ; they are each marked by a perch, and are easily avoided.

The course across the bar is S. by W.  $\frac{3}{4}$  W., whence the river trends southward, and then in a south-easterly direction,  $4\frac{1}{2}$  miles to Coleraine. There is very little flood stream in the river, and with southerly winds vessels are obliged to warp up to the quays. The ebb stream runs 3 knots in the entrance, and from  $1\frac{1}{2}$  to one knot farther up ; but during heavy rains the freshes from lough Neagh greatly increase the force of the ebb, while the flood stream is not felt.

The difficulty of crossing the bar is so great that few vessels attempt it.

**A Pilot** for the river may be obtained at port Rush.

The town of Coleraine stands on both sides of the river, about 4 miles from the sea. Population in 1871, 5,631. A bridge across the river, immediately below the town, unites the Ballymena and Londonderry railways. Since the rise of Belfast, the linen manufacture of Coleraine has fallen off ; but the town carries on a brisk export trade through port Rush. In 1873 the arrivals were 432 vessels of 47,271 tons.

Westward of the Bann the shore composed of rocky precipices rises a short distance inland to 1,250 feet elevation in the summit of mount Benevenagh. The cliffs are succeeded by a low sandy beach extending  $4\frac{1}{2}$  miles to Macgilligan point, and clear of danger until Tuns bank is approached.

**TIDAL STREAMS.**—It is high water, full and change, at port Rush, at 6 h. 8 m. ; springs rise  $5\frac{1}{4}$  feet, neaps  $3\frac{1}{4}$  feet : at the entrance of the Bann, at 6 h. 14 m. ; springs rise  $6\frac{1}{4}$  feet, neaps 4 feet : at Coleraine, at 6 h. 24 m. ; springs rise  $6\frac{1}{4}$  feet, neaps 4 feet. One mile off Bengore head, the stream turns about 15 minutes after high and low water at Liverpool ; springs run 3 knots, the ebb setting W.N.W. and the flood E. by S. In the bays on each side of the heads, there is an eddy at half-tide.

At the Skerries, the ebb stream sets fairly through the anchorage and sound to the westward, attaining a velocity of 3 to  $3\frac{1}{2}$  knots in its passage between Ramore head and Carr rocks, and creating a very troublesome sea.

The flood stream sets from Ramore head towards Carr rocks ; when the sound is entered it sets fairly through.

In Broad sound the flood stream sets down on Little Skerrie, while the ebb inclines to the northward through the sound.

At the anchorage under Great Skerrie there is little stream of tide felt ; on the flood it is slack water at half-tide, on the ebb with the last-quarter, while on the north side of the rocks the stream runs with a velocity of 3 knots.

The eddies in port Rush bay make the harbour difficult of approach in light winds ; only the first quarter of the ebb sets from Ramore head towards the harbour ; an eddy commences then, running for the remainder of the ebb and the whole of the flood, from the harbour out along the rocks to the northward. After the first quarter of the flood an eddy commences close in shore, setting from the mouth of the harbour to the westward. On leaving the harbour, as soon as the line of this eddy is crossed, the flood sets strongly towards Ramore head, and across the entrance of Skerrie sound, which must be carefully attended to by a vessel leaving port Rush in light winds, for the heavy ground swell always breaks furiously on the rocks around Ramore head, and there is no safe anchoring ground.

As we proceed westward, towards lough Foyle, the tide loses much of its strength ; north of the mouth of the Bann, 3 miles off shore, its average rate at springs is  $1\frac{1}{2}$  knots.

There is an eddy tide all the way along the shore from the Skerries to the mouth of the Bann, commencing at half-tide, the line of its junction with the main stream being marked by strong rippling.

Two miles north of port Stewart the channel stream turns to the eastward 1 hour and 40 minutes after low water at Liverpool, or at high water on the adjacent shore ; and to the westward 31 minutes after high water at Liverpool, or three-quarters of an hour before low water on the adjacent shore ; so that, on this part of the coast, the advance of the tide wave is opposed to the tidal stream, and presents the anomalous appearance of the stream coming in from the ocean during the falling tide, and from the opposite quarter when it is rising on the shore.

All the coast to the westward of Fair head is subject to a ground swell ; which increases with the commencement of the east-going stream.

**LOUGH FOYLE**,\* an extensive estuary, upwards of 13 miles long from east to west, and about  $6\frac{1}{2}$  miles wide, is for the greater part occupied by shallows. It, however, affords secure anchorage for the largest ships, and is accessible at all times of tide.

The north shore of the lough is mountainous, terminating seaward in the abrupt precipice of Inishowen head. Slieve Snaght, near the middle of the peninsula of Inishowen, attains an elevation of 2,009 feet. The south shore is low, and backed by the rocky precipices of mount Benevenagh. The great level on this shore was taken advantage of by the Ordnance surveyors, in 1828, for the measurement of their base of verification. The base line extended from near Ballykelly to mount Sandy on the Macgilligan shore, and measured 41,640 feet. At the extremes of

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\* See Admiralty plan of lough Foyle, No. 2,499 ; scale,  $m = 1\cdot8$  inches.

the base, and at two intermediate stations, measures have been adopted to preserve the base points in such a manner that they may be available for future reference. Macgilligan point, with a martello tower at its extremity, terminates this low district, and forms the south point of entrance to the lough.

**Greencastle**, a modern fortress, built near the ruins of the ancient castle, is on the shore opposite Macgilligan point; and, in conjunction with the martello tower on the latter, defends the approach to lough Foyle.

The entrance between Macgilligan point and the Inishowen shore, half a mile wide, with a depth of 10 fathoms water, is approached by two channels, one on each side of Tuns bank. The deeper and more direct passage is that between the bank and the Inishowen shore, called North channel, with an average width of more than half a mile, from 8 to 10 fathoms water, and steep-to on both sides. South channel, between Tuns bank and Macgilligan shore has only from 15 to 17 feet water, and is about 2 cables wide.

The anchorage for large ships is from 2 to 3 miles within the entrance, abreast the town of Moville, which has daily communication with Derry by cars, and by steam-vessel during the summer months. Supplies to a limited extent may be procured here, and water from wells near the town, but the streams which descend from the hills are impure.

**Pilots.**—There are two pilot stations, one close to Inishowen light-houses, the other at Tremone, 6 miles north-westward of Inishowen head. The rates are, 14*s.* for vessels under 7 feet draught, increasing to 4*s.* 4*d.* per foot for vessels of 15 feet draught and upwards, from Inishowen head to the quays of Derry. Vessels towed by steamers pay from two-thirds to four-fifths rates. Steam tugs are on the look-out at Moville, or may be procured from Derry, 16 miles distant.

**Life-boat.**—A life-boat is stationed at Greencastle.

**LIGHTS.**—Two lighthouses, on Dunagree point, half a mile south-west of Inishowen head, exhibit each a *fixed white* light, the east light at an elevation of 67 feet, the west light at 92 feet, and they are visible in clear weather at the distances of 13 and 15 miles. A sector of *red* light is shown from the west tower, at 25 feet below the white light, over the north-east end of Tuns bank, between the bearings W.N.W.  $\frac{1}{4}$  W. and N.W.  $\frac{3}{4}$  W. The lighthouses bear from each other E.  $\frac{1}{4}$  N. and W.  $\frac{1}{4}$  S., are 153 yards apart, and when in line clear the Tuns.

At Warren point, on the north side of the entrance,  $1\frac{1}{4}$  miles westward of Inishowen lights, a *fixed* light is exhibited at a height of 15 feet above high water. The light shows *red* southward between the bearings about E. by N.  $\frac{1}{4}$  N. and W.  $\frac{1}{4}$  S.; *white*, seaward, from about the bearing W.  $\frac{1}{4}$  S. northward as far as the land will allow, and is not cut off for

Bluick rock and other outlying dangers; it also shows *white* up lough Foyle when bearing from about E. by N.  $\frac{1}{4}$  N. to about E.  $\frac{1}{2}$  N. From the latter bearing to the shore the light is obscured.

**Tuns Bank**, of a triangular form, extends about  $2\frac{1}{4}$  miles in an E. by N. direction from the Macgilligan shore. Its highest part is near the north edge, which is steep-to, and preserves a direction nearly parallel to the opposite shore of Inishowen. In general outline the bank has undergone little change since the earliest surveys, its aspect however varies with the weather; in fine weather the sand accumulates on its highest part, and is seldom covered by the highest tides, but is again dispersed by a prevalence of north-west gales. Two *black* buoys mark the east and west extremes of the bank. The east buoy, in 6 fathoms water, has Inishowen east light bearing W.N.W. one mile distant, and the west buoy W.S.W.  $2\frac{3}{4}$  miles. The west buoy, in  $4\frac{1}{2}$  fathoms, is near the north-west angle of the bank, with Macgilligan tower W.  $\frac{1}{2}$  N., two cables from the shore, and serves to mark the north-east side of South channel. Glengad head open of Inishowen head, N.W. by N. (view A. chart 2,499), leads north-east of the Tuns in 8 fathoms, at a distance of 3 cables outside the buoy. By night, the lights in one, bearing W.  $\frac{1}{4}$  S., leads nearly half a mile northward of it.

**Bluick Rock**, uncovered at half ebb, and marked by a conspicuous iron beacon painted *red*, is  $\frac{8}{10}$  mile to the westward of Inishowen light-houses, and at the distance of more than half a cable from the shore; by not approaching within a cable's distance of the shore, all danger will be avoided.

**Moville Bank** covers the shore from Carnagarve house to the new pier at Carrickarory, extending abreast Moville to 3 cables off; its outer edge is marked by a *red* buoy in 10 feet water. A short distance within the buoy there are from 4 to 5 feet only. To the westward of the new pier, the shore is moderately bold-to for  $1\frac{1}{2}$  miles, or until Clare river has been passed, and may be approached by the lead to the depth of 3 fathoms: under Bank head this depth will be found at half a cable's distance from the rocks.

**McKenny Bank** bounds the navigable channel to the southward. Its northern edge, marked by two *black* buoys, dries, and is very steep-to, with 5 fathoms at half a cable's distance, and 9 to 10 fathoms between it and the opposite shore. The bank continues upwards of 4 miles to the westward of the buoys, and joins the great flats. There is a narrow channel between its east end and Macgilligan point; also a swashway opposite the new pier at Moville leads across the bank and by an intricate channel towards the river Roe.

**North Middle Bank** is a narrow ridge, with 6 and 7 feet water, and steep-to. From its east extreme the new pier bears N. by E.  $\frac{1}{2}$  E.,

half a mile distant. The channel between it and the north shore, leading to West channel, carries 6 and 7 fathoms water until the entrance to the latter is approached. Two blind channels, East and Crooked channels, run into the flats, one on each side of Middle bank.

**Anchorages.**—Large ships may anchor off Moville with Inishowen lighthouses open of Greencastle bearing E. by N.  $\frac{1}{4}$  N., and with Ark house (standing near the water at the west end of Moville) bearing between N.  $\frac{1}{2}$  W. and N.N.E.  $\frac{1}{2}$  E., in from 6 to 9 fathoms, sand and mud; or with the lights shut in and with Ark house on the above bearing, but going no farther to northward than to bring the tower of Greencastle fort on with the south end of the ferry house, in order to clear Moville bank. They may also anchor for  $1\frac{1}{2}$  miles to the eastward of this, with the lighthouses open or a little shut in; but near the entrance the tides are stronger and the holding-ground is not so good as farther in.

For small vessels bound to Derry, a more convenient anchorage will be found off the new pier, within the tail of Middle bank, with the tower of Greencastle church in line with Glenburnie cottage, E. by N.  $\frac{1}{4}$  N. (view E. chart 2,499); and the pier between N. by W.  $\frac{1}{2}$  W. and N.E.  $\frac{1}{2}$  N., in from 3 to 5 fathoms water, on mud and sand, or as much closer to the pier as convenient, the water shoaling gradually towards it. At the pier head there is only 7 feet at low water; small vessels find good shelter under it with south-west winds, but south-east winds blow right into it.

**TIDES.**—It is high water, full and change, at

			h.	m.		feet.	feet.
Warren point, near the entrance of							
lough Foyle	-	-	at	6 20	Springs rise	$6\frac{1}{2}$	neaps 5
Moville	-	-	„	7 6	„	$7\frac{1}{2}$	„ $5\frac{1}{2}$

At the east buoy on the Tuns the stream turns nearly at the same time with the channel stream, but is influenced by the harbour tide; on the last quarter only of the flood, by the shore, does it set towards the harbour. Half an hour before high water on the shore it is slack; at high water it commences its course to the south-eastward; and when the ebb makes out of the harbour it bends round to the northward. At low water on the shore the stream sets N.N.E.; without any slack water, it continues to bend round to the westward, until the last-quarter flood, when it drains towards the harbour: its maximum rate is 2 knots.

In the entrance, between Greencastle and Macgilligan point, the flood stream does not make in, until one and three-quarters hours after low water by the shore; and the ebb stream does not make out until one hour after high water.

The first of the outgoing stream sets towards the Tuns; the middle



1. The first step in the process is to identify the problem or issue that needs to be addressed. This involves gathering information and understanding the context of the problem.

ALL INFORMATION CONTAINED HEREIN IS UNCLASSIFIED  
DATE 08-28-2001 BY 60322 UCBAW

W. by S. & S.  
for the

... through South channel:  
... berth by coming no  
... school-house (the first house  
... brought in line with the west end of

the Revenue barracks, N.W.  $\frac{1}{4}$  N., (view C., chart 2,499,) the leading mark through.

From abreast Greencastle to the anchorage off Moville, is W.  $\frac{3}{4}$  S.  $2\frac{1}{2}$  miles ; the channel between McKennys bank and the Inishowen shore is half a mile wide, with from 8 to 10 fathoms water. Inishowen lights in sight to the southward of Greencastle, bearing E. by N.  $\frac{1}{2}$  N., will lead up in mid-channel, and is also a good mark for the anchorage. With a working wind there is no danger in standing towards the shore until near Carnagarve house, where Moville bank begins ; to clear which, tack before the tower of Greencastle fort comes in line with the south end of the ferry house, E. by N. : the bank is steep-to, and this mark leads less than half a cable from its edge.

Standing to the southward, Macgilligan point is steep-to, as is also the northern edge of McKennys bank ; tack short of the *black* buoys. When to the westward of the buoys, a useful mark for clearing the north edge of the bank, is the east lighthouse on Inishowen head, touching the north side of Warren rock, E. by N.  $\frac{3}{4}$  N., until  $1\frac{1}{2}$  miles to the westward of the buoy, or until Ark house at Moville bears N.  $\frac{1}{4}$  W., after which the edge of the bank curves to the northward and this mark leads on to it. The helm must be put down before the lighthouse touches the rock. If intending to bring up at the inner anchorage off the new pier, a vessel should proceed along the edge of Moville bank, with the tower of the fort and the ferry house in line, until the *red* buoy has been passed, or until the pier bears N.W. by W.  $\frac{1}{4}$  W. ; then haul up W. by N. until the tower of Greencastle church comes in line with Glenburnie cottage, E. by N.  $\frac{1}{4}$  N., the anchoring mark. Strangers should not attempt to proceed farther than this without the assistance of a pilot.

**West Channel**, between Great bank and the north shore, is the navigable channel to the river Foyle and Londonderry, and is well marked by pile lighthouses, buoys, and beacons. The north side of the channel is bordered by a bank of hard ground, that extends from Clare river westward to as far as Quigley point ; its outer edge, called the Ridge, dries, and is marked by a pile lighthouse and a *red* buoy.

**LIGHT.—Redcastle Lighthouse**, on piles and painted red, stands near the edge of the Ridge, opposite Redcastle house, nearly half a mile from the nearest shore, and exhibits a *fixed white* light, at an elevation of 25 feet.

A *red* buoy, in 12 feet water, one cable E.S.E. from the lighthouse, marks the north side of the entrance to West channel. A similar depth of 12 feet will be found at the distance of 2 cables from the perch on Quigley point. The shore between them, abreast White castle, is steep to ; at other parts it may be approached by the lead.

The south side of the channel to as far as Ture spit, a distance of  $4\frac{1}{2}$  miles, is marked by two pile lighthouses, and six *black* buoys, all near the edge of Great bank, which is steep-to. A short distance within the eastern lighthouse the bank dries.

**LIGHTS.**—**White Castle Lighthouse**, on piles, and painted black, is on the south-east side of the channel, opposite White castle, and exhibits a *fixed white* light, at an elevation of 26 feet.

**Ture Lighthouse**, on piles, painted black, is on Ture spit, in 7 feet water; nearly 3 miles W.S.W. southerly, from White Castle lighthouse, and shows a *fixed white* light, at an elevation of 25 feet.

The first *black* buoy, in 26 feet water, is on the east end of Great bank, and with the red buoy on the Ridge, from which it is 3 cables distant, in a S.  $\frac{1}{2}$  W. direction, serves to mark the entrance of West channel. A flat extends from the Ridge, in a westerly direction, quite across the channel; the deepest water, 17 feet, being on the south side, near the edge of Great bank, and there is not more than 13 or 14 feet in mid-channel.

In the channel between Redcastle lighthouse and Quigley point, there are from 5 fathoms to 17 feet water, shoaling from the latter depth to 11 feet abreast Ture lighthouse. A flat extends from Ture lighthouse in a north-easterly direction across the channel, over which it would be difficult to find so much as 11 feet at low water.

**LIGHTS.**—**Cunnyberry Lighthouse**, on the north-west side of the channel, in 11 feet water, is built on piles, painted red, and shows a *fixed white* light, at an elevation of 25 feet.

**Culkeeragh Light**, *fixed* and *white*, at an elevation of 50 feet, is shown from a circular brick tower on the shore opposite Culmore fort, and when in line with Cunnyberry lighthouse, S.W.  $\frac{1}{4}$  W., (view F., chart 2,499,) leads across the flats.

**Culmore Light**, *fixed* and *white*, is exhibited at Culmore point, at a height of 45 feet, from a mast and lantern.

The channel over the flats has been much improved by dredging, and is now 450 feet wide, with a depth of 11 feet at low water. The direction of the cutting is indicated by eight wooden perches, four on each hand, *red* on the north-west side, *black* on the south-east side, there is also a *red* buoy on the north-west side. About midway and on the north-west side of the cutting is Crummin perch, distinguished by a ball on its summit; the flat that lines the north-west shore dries close out to it. The other perches stand in 8 or 9 feet water, except the first black perch to the westward of Ture lighthouse, which is close to the margin of the bank; the lights in line lead directly to this perch.

After passing the western perches, the deepest water will be found to the southward of the line of the leading lights. Abreast Cunnyberry lighthouse there is 21 feet water, and the channel, one cable wide, is marked on the south-east side by a *black* buoy. The shores of the lough begin now to approach each other, and the construction of great embankments in this locality has brought them still nearer each other. From Cunnyberry lighthouse a S.W. by W.  $\frac{3}{4}$  W. course, three-quarters of a mile, leads to the entrance of the river Foyle, where between Culmore point and the opposite shore it is little more than a cable wide, with a depth of 49 feet.

Vessels may anchor anywhere in West channel: a usual berth is with the perch off Quigley point bearing N.N.W.  $\frac{3}{4}$  W. 3 cables distant, in 17 feet water; large vessels stop half a mile to the eastward of this, in 4 fathoms water, where they discharge part of their cargo before proceeding up to Derry. Vessels ride here at all times in perfect security under shelter of Great bank.

**RIVER FOYLE.**—From Culmore point to the ship quay at Derry is 4 miles in a south-westerly direction. The channel is well marked by buoys and beacons, and at night by lights.

**LIGHTS.**—Near the shore at Boom hall, 2 miles from Culmore point, is a *fixed white* light, to be left on the starboard hand.

In Rosse bay a *fixed white* light is shown from a pile lighthouse to be left on the port hand, and another *fixed white* light is at Rock mill, near the graving dock on the north-west shore.

In many places the channel is not more than three-quarters of a cable in width, with from 5 to 9 fathoms water, and is overhung by steep banks, thickly wooded. In Rosse bay the space is occupied by extensive mud-banks, between which the channel winds in a tortuous course towards Derry, with a depth of from 13 to 15 feet water, deepening, as the town is approached, from 3 and 4, to 6 and 7 fathoms near the south end of the city, where the river is crossed by an iron bridge.

The river Foyle continues navigable for small vessels to Duninalong,  $4\frac{3}{4}$  miles above Derry, where they can lie afloat in 9 or 10 feet at low water. Barges proceed about 4 miles farther up, where they enter a canal to Strabane.

The city of Londonderry, situated on a hill rising to an elevation of 119 feet above high water, is surrounded by an ancient rampart with six gates, beyond which the buildings have considerably extended. The cathedral on the summit of the hill is a conspicuous object from the river, and may be seen from most parts of lough Foyle. There are two flax-spinning mills, several flour mills, and other manufactures are carried on. Supplies are abundant, and repairs of ships in wood or iron, and also of steam machinery, can be effected.

A graving dock, 305 feet long on the floor, and 50 feet wide at the entrance, with 15 ft. 9 in. over the sill at high water spring tides, has been constructed, and the quays have been much improved. Power of largest crane 3 tons.

The exports, chiefly of agricultural produce, are considerable. The salmon fishery of lough Foyle is very productive; upwards of 36,000 are taken annually, the greater part being shipped to Liverpool. In 1875, there were 32 vessels belonging to the port, of 7,925 tons; of which 8 were steam-vessels, of 552 tons. In the same year the arrivals were, coastwise, 1,205 vessels = 222,380 tons; foreign, 94 = 43,837 tons: and the sailings were, coastwise, 1,135 vessels = 215,426 tons; foreign, 55 = 31,191 tons. Population in 1871, 25,242.

The Great Northern Railway runs along the north bank of the Foyle towards Strabane, while another line branches off to Buncrana, and the railway to Coleraine occupies the south shore below the bridge.

A small pamphlet containing the bye-laws of the port may be had at the harbour office.

**TIDES.**—It is high water, full and change, at

		h. m.		feet.	feet.
Quigley point	- -	7 16	Springs rise	7½	neaps 5½
Londonderry	- -	8 0	"	7½	" 5½
Above the bridge, Dunalong		8 30	"	7½	" 6
" Burdennett		9 0	"	5½	" 5

**Directions.**—To proceed upwards from off Moville, leave with the first of the flood: from the inner anchorage, it is W. by S.  $\frac{1}{2}$  S. 3 miles to Redcastle lighthouse; Greencastle church kept in line with Glenburnie cottage, E. by N.  $\frac{1}{4}$  N., leads northward of Middle bank, in from 4 to 6½ fathoms water. Crossing the flat abreast Redcastle lighthouse, a vessel will carry from 14 to 15 feet at low water; from this, W.  $\frac{3}{4}$  S. 1½ miles will bring her to Whitecastle lighthouse; if compelled to make a tack here, remember that the channel is only 2 cables wide, and steep to on both sides; from hence to the anchorage at Quigley point is W. by S.  $\frac{3}{4}$  S. one mile. The channel then trends more to the southward; from the anchorage it is S.W. by W.  $\frac{1}{4}$  W. about 2 miles to Ture lighthouse, which, as well as all the *black* buoys on the edge of Great bank, must be left on the port hand. The leading mark across the flats, in 11 feet water, is Culkeeragh lighthouse in line with Cunnyberry lighthouse, S.W.  $\frac{1}{4}$  W., passing between the *red* and *black* perches, and leaving Cunnyberry lighthouse on the starboard hand. After the western perches have been passed, keep well to the southward, as there is 13 and 14 feet water in that direction, while the lights in line lead into 8 or 9 feet near Cunnyberry.

From Cunnyberry lighthouse it is S.W. by W.  $\frac{3}{4}$  W., three-quarters of a mile to the entrance of the river Foyle. Rounding Culmore point, keep in mid-channel for about one mile, and then along the north shore, until the lighthouse at Boomhall is approached, when the channel bends to the southward through Rosse bay; sailing through which, leave the *red* beacons and buoys on the starboard hand, and the *black* buoys and pile lighthouse on the port hand. Arrived at Derry a vessel may anchor anywhere in front of the town, convenient for hauling alongside the quays.

Vessels dropping down the river in light winds must remember that the tide does not set fairly through the channel until the banks begin to uncover, and that the first of the ebb sets from Cunnyberry lighthouse towards East channel.

**THE COAST** from Inishowen head to Glengad head, a distance of 10 miles in a N.N.W.  $\frac{3}{4}$  W. direction, presents a bold precipitous aspect, backed by high hills; and is steep-to and free from danger, with from 8 to 10 fathoms water one quarter of a mile off, and 11 to 15 fathoms at twice that distance. Glengad head is a bluff headland with a remarkable hummock near its extremity:  $2\frac{1}{2}$  miles to the southward of it is Culdaff bay,\* which affords a good roadstead to vessels bound westward, being sheltered from winds from N.N.W., round by the west, to S.S.E. The strong tide streams that run outside do not enter here, but keep down the sea within the bay to a remarkable degree. It also happens that when the wind veers to the northward, and the anchorage becomes exposed, a vessel can sail into lough Foyle. Inishtrahull lighthouse just seen outside of Glengad head, and the fishing station bearing N.W.  $\frac{1}{4}$  N., marks the anchorage in 4 fathoms, sandy bottom. Carrickaveol head is two and three-quarters miles to the north-west of Glengad head and  $1\frac{1}{2}$  miles farther is Stookaruddan, a single bold rock of 229 feet elevation, with a narrow boat pass between it and the shore.†

**MALIN HEAD**, the north point of Ireland, presents a bold jagged shore fringed by outlying rocks, which are always visible and steep-to, having from 13 to 20 fathoms at the distance of  $1\frac{1}{2}$  cables from them.

**GARVAN ISLES**‡ are barren islets and rocks from 50 to 75 feet above the sea, and surrounded by sunken rocks and shoals. Duvglas, the northernmost islet, has an elevation of 65 feet. Doherty rock, un-

\* See plan of Culdaff bay on Admiralty chart, Ireland, sheet III., Larne to Bloody foreland, No. 46.

† See Admiralty chart, Kinnagoe head to Dunaff head, No. 2,811; scale,  $m = 2\cdot0$  inches.

‡ See plan of Garvan sound and isles, on Admiralty chart, Kinnagoe head to Dunaff head, No. 2,811.



• **LIGHT.**—The lighthouse, a white tower 42 feet high from base to vane, on the eastern and highest hummock, exhibits, at an elevation of 181 feet above high water, a *revolving white light every half minute*, visible in clear weather at the distance of 18 miles. Stores for the use of the lighthouse are landed at Portmore, a creek on the north side of the island.

**TIDES.**—It is high water, full and change, in Culdaff bay, at 5h. 53m.; springs rise  $8\frac{3}{4}$  feet, neaps 6 feet. In Inishtrahull sound the south-east stream sets from half-flood by the shore to last-quarter ebb, the north-west stream from 5 hours ebb till half-flood, at the rate of 4 knots on springs. One mile to the northward of Glengad head the stream begins to set to the south-east at last-quarter flood, and runs till 4 hours ebb. At low water it sets N.W., and continues till half-flood, when it slacks for one hour, and then sets to the south-east. Close in-shore there is a counter tide to the southward of Glengad head with the south-east stream, and to the northward of it with the north-west stream; also between Malin head and Ireland's north point with the west-going stream.

**NORTH CHANNEL** from the Calf of Man to Rathlin island is deep and clear, and with the exception of the coast between Strangford narrows and Belfast lough described at p. 143, and the Maidens described at p. 161, is moderately bold-to on both shores. To the westward of Rathlin the bottom is very uneven. Shamrock knoll, 5 miles N.N.W. of Bull point, has 9 fathoms water, with 60 to 80 fathoms close around it. Middle bank, 8 miles to the south-west of Islay, is an extensive rocky bank with pinnacles of 15 to 19 fathoms, and from 60 to 70 fathoms on each side of it; to the westward of this the water becomes shoaler. To the northward and eastward of Inishtrahull the bottom is very irregular, with patches of 17 and 18 fathoms, and 25 to 39 fathoms between them, all on rocky and coarse ground. Hemptons Turbot bank, a narrow ridge of coarse sand, runs in an E.S.E. direction from Inishtrahull; its shoalest water, 16 fathoms, is 7 miles distant from the island, and it has generally from 5 to 10 fathoms less than is found either to the northward or southward of it. The rocky pinnacles to the north-west of Rathlin island occasion overfalls, which in unsettled weather become dangerous for small vessels. With ordinary care, however, North channel may be safely navigated, and under many circumstances it will be found a desirable outlet to the ocean for ships bound from the ports in the Irish sea to the northern ports of the American continent.

**GENERAL DIRECTIONS.**—If after leaving a port in the Irish channel the wind should hang to the southward, it will be a matter for consideration whether to proceed by North or South channel.



[illegible]

westward of it will give the seaman timely warning of his approach to the Irish shore. Both sides of the channel may be approached to the depth of 35 fathoms, but it must be borne in mind that this depth is found very close to Bardsey island, and within 4 miles of the south end of Arklow bank. On weathering the Smalls, it is advisable to keep well to the westward, if the wind will permit, so as, on advancing southward, to give Scilly a large berth.

In South channel there are but two harbours of refuge, Kingstown and Holyhead: the former, in the bay of Dublin, is described at p. 99; the latter, on the coast of Wales, is the more easy of access, and is now well sheltered by the new pier. At the entrance of the channel there are two harbours, Waterford and Milford: the former, a bar harbour, with 12 feet water, is described at p. 49; the latter is accessible at all times of tide. It may be useful also to name South bay, Wexford, described at p. 80, as affording good anchorage with certain winds.

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**TABLE OF POSITIONS**  
**ON THE**  
**SOUTH, EAST, AND NORTH, COASTS OF IRELAND,**  
**From the Ordnance Survey.**

Place.	Particular Spot.	Latitude, North.			Longitude, West.		
		°	'	"	°	'	"
Mizen hill - -	Δ - -	51	27	41	9	48	19
Crookhaven - -	Lighthouse - -	51	28	33	9	42	17
Fastnet - -	Lighthouse - -	51	23	19	9	36	8
Clear island - -	Old lighthouse - -	51	26	3	9	29	18
Stag rock - -	Largest - -	51	28	5	9	13	27
Galley head - -	Δ - -	51	31	47	8	57	7
Seven heads - -	Tower - -	51	34	14	8	42	51
Old head - -	Lighthouse - -	51	36	45	8	32	0
Kinsale, Charles fort - -	Lighthouse - -	51	41	48	8	29	50
Roche point - -	Lighthouse - -	51	47	33	8	15	15
Cork harbour - -	Haulbowline coal wharf. - -	51	50	33	8	18	20
Ballycotton - -	Lighthouse - -	51	49	31	7	59	3
Knockmealdown mountain - -	Δ - -	52	13	39	7	54	54
Capel island - -	Tower - -	51	52	54	7	51	10
Youghal - -	Lighthouse - -	51	56	23	7	50	15
Mine head - -	Lighthouse - -	51	59	30	7	35	13
Helvick head - -	Δ - -	52	3	0	7	32	39
Dungarvan - -	Ballinacourty light-house. - -	52	4	42	7	33	10
Great Newtown head - -	Metal-man tower - -	52	8	13	7	10	15
Waterford - -	Hook lighthouse - -	52	7	24	6	55	43
" - -	Passage quay - -	52	14	20	6	58	20
" - -	Cathedral - -	52	15	33	7	6	24
Tory hill - -	Δ - -	52	20	53	7	7	31
Great Saltee - -	South end - -	52	6	41	6	37	15
Forth Mountain - -	Δ - -	52	18	57	6	33	41
Tuskar - -	Lighthouse - -	52	12	9	6	12	22
Wexford - -	College - -	52	20	4	6	28	15
" - -	Ship yard - -	52	20	0	6	27	3
Tara hill - -	Δ summit - -	52	41	55	6	13	1
Blackstairs mountain - -	Δ - -	52	32	55	6	48	17
Wicklow head - -	Lighthouse - -	52	57	54	6	0	5

Place.	Particular Spot.	Latitude, North.			Longitude, West.		
		°	'	"	°	'	"
Bray head -	- Δ -	53	10	39	6	4	55
Killiney hill -	- Mapas obelisk -	53	15	52	6	6	37
Kingstown -	- East pier lighthouse -	53	18	7	6	7	31
Poolbeg -	- Lighthouse -	53	20	31	6	9	1
Dublin -	- Observatory (Dome) -	53	23	14	6	20	16
Bailey -	- Lighthouse -	53	21	41	6	3	5
Rockabill -	- Lighthouse -	53	35	48	6	0	11
R. Boyne -	- Maiden tower -	53	43	20	6	15	7
L. Carlingford -	- Haulbowline lighthouse -	54	1	11	6	4	41
Dundrum bay -	- St. John point light-house.	54	13	34	5	39	30
South rock -	- Lighthouse (dis-used) -	54	23	56	5	25	4
Donaghadee -	- Lighthouse -	54	38	41	5	31	49
Copeland islands -	- Lighthouse -	54	41	45	5	31	21
Belfast lough -	- Grey point (extreme) -	54	40	35	5	44	20
L. Larne -	- Lighthouse, Farres point.	54	51	7	5	47	21
Maidens -	- West lighthouse -	54	55	48	5	44	17
Rathlin island -	- Lighthouse on Altacarry head.	55	18	5	6	10	13
Benbane head -	- Summit of cliff -	55	15	3	6	28	45
Inishowen head -	- East lighthouse -	55	13	34	6	55	35
Moville -	- New pier -	55	10	50	7	3	20
Londonderry -	- Cathedral -	54	59	40	7	19	25
Inishtrahull -	- Lighthouse -	55	25	57	7	13	37
Malin head -	- Tower -	55	22	50	7	22	22

## TABLE,

Showing the Time of HIGH WATER on Fall and Change Days, with the Rise at Springs and Neaps above the Mean Low Water Level of Ordinary Spring Tides, at the principal places on the South, East, and North, Coasts of Ireland.

Place.	High Water, Fall and Change.		Rise, Springs Neaps.		Place.	High Water, Fall and Change.		Rise, Springs Neaps.	
	h. m.	ft.	ft.	ft.		h. m.	ft.	ft.	ft.
Croskiven -	4 3	3½	4		Bulbriggut -	10 40	13		
Shail -	4 2	3½	7½		Drogheda (Bar) -	11 0	11½	9	
Cape Clear -	4 0	2	6½		Dundalk Lt. House -	10 56	15	11½	
Baltimore -	4 23	10½	3½		Carlingford (Bar) or Cranfield Point -	11 0	16	12	
Castletownsea -	4 21	10½	4		Warren Point -	11 10	14½	12	
Cumacilly Bay -	4 30	11	4½		Newcastle -	10 52	16	12½	
Coarumacsherry -	4 36	10½	4½		Armagh -	11 0	16	12	
Kinsale -	4 43	11½	9		Lough Strangford } (Killed Point) -	10 53	14	11½	
Queensdown -	5 1	11½	4		Strangford } Quay -	0 31	10½	8½	
Cock, (Pencose Quay) -	4 58	12½	10		Quale Quay -	0 45	11	9½	
Bulwerin -	4 54	12	9½		Kircubbin -	0 42	11½	9½	
Youghal -	5 14	12½	10		Killybegh -	0 40	11	9½	
Ballinacorney, } Dungarvan -	5 12	12½	9½		Head of the Lough } (Turley Rocks) -	0 44	11½	9½	
Dunmore -	5 17	12½	9½		South Rock -	10 58	13	10½	
Waneford, (Dun- canova Fort) -	5 20	12½	10		Dunghalree -	11 13	11½	9½	
—, (Bridge) -	6 6	13½	10½		Belfast -	10 43	9½	8	
New Ross -	6 4	12½	10		Lough Larne -	10 48	6½	6½	
Salvors -	5 40	13	10		Maiden Rocks -	10 43	6½	6½	
Wexford -	7 21	5	3½		Caralough -	10 51	5½	5	
Kilwichel Point -	8 0	4½	2½		Red Bay Pier -	10 31	4	4	
Arklow -	8 0	4	2½		Ballycastle Bay -	6 25	3	2	
Wicklow -	10 29	8	6½		Skerries -	6 15	5	3	
Bray Head -	10 45	12	9½		Port Rush -	6 8	5½	3½	
Dalkey Island -	10 45	13	11		Coleraine -	6 24	6½	4	
Kingsdown -	11 12	11½	8½		Londonderry -	8 1	7½	5½	
Dublin Bay (Pool- bog Lt. House) -	11 12	12-14	9-11		Morville -	7 6	7½	5½	
Houth Harbour -	11 9	13	10		Lough Foyle - } Warren Point -	6 20	6½	5	
Malahide Inlet -	11 13	10	8		Caldiff Bay -	5 53	8½	6	
Rugersown Inlet -	11 13	10½	8		Slievebane Bay -	5 49	10½	7½	
Skerry Islands -	11 0	13	10						

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**LONDON :**  
**Printed by GEORGE E. EYRE and WILLIAM SPOTTISWOODS,**  
**Printers to the Queen's most Excellent Majesty.**  
**For Her Majesty's Stationery Office.**  
**[8206.—1000.—10/77.]**











